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ORIGINAL COMMUNICATION.

SCLEROTOMY *versus* SCLERECTOMY.

BY

H. HERBERT, F.R.C.S.,

NOTTINGHAM, ENGLAND.

As a preliminary to further progress in the operative treatment of glaucoma, it is desirable that the varieties of iris-free leaking cicatrices should be clearly recognised, together with their relative advantages and drawbacks.

Types of Pervious Cicatrices.

The widest difference exists between a fairly large, clear, subconjunctival sclero-corneal stoma or fistula and a true filtering cicatrix (see THE OPHTHALMOSCOPE, Vol. V [1907] pp. 292-3.) In some of the eyes which have now been examined histologically at various periods after sclerectomy, a definitely open track has been found leading from the anterior chamber to the subconjunctival tissue. In others, the sclero-corneal gap has become filled with fibrous or fibro-cellular tissue, generally firm enough to block filtration.

In finding its way to the surface from a wide free opening, the aqueous opens up the conjunctival tissue spaces, forming vesicular cavities. In extreme cases the conjunctival tissue becomes pressed aside so much in part of the "filtration area" that only the thinnest of transparent films may be left retaining the aqueous, any opening made in the film at once emptying the anterior chamber. Obviously the protection against invasion of the eye by external organisms is of the flimsiest, and in some cases the free leakage keeps the tension of the eye considerably below normal. Any approach to this disfiguring and dangerous result of localized leakage is to be avoided at considerable cost, whenever possible.

To favour wide diffusion of aqueous under the conjunctiva, Lt.-Col. R. H. Elliot first insisted upon the avoidance of conjunctival incisions reaching the limbus, fully outlining a flap with base at the limbus.* Such incisions not only tend to localise filtration, but must also interfere with the nutrition of the flap. Poor nutrition, again, must act doubly, tending to vesicular rarefaction of the conjunctiva, and hindering down-growth of tissue into the sclero-corneal opening.

The rounded vesicular patch tends gradually to overlap the corneal margin. Although adherent to the cornea, I know of no evidence to show that corneal tissue actually takes any considerable part in its formation. Apparently the limbus must still be accepted as the extreme anterior limit of any possible permanent opening in the hard coat of the eye, so far as its superficial surface is concerned.

A fistulous track of very moderate size, situated a little away from the limbus, may give rise to considerable diffuse œdema of the conjunctiva, often with opacity sufficient to render the underlying scar or opening invisible.

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*Obviously also placing the sclero-corneal opening a millimetre or more behind the adherent limbus, under looser and thicker conjunctiva, must tend to lessen the objectionable local conjunctival changes. The intentional placing of the opening thus further back than necessary could perhaps only be justified (1) by making the track through the sclero-corneal tissue somewhat oblique, to reach the deep surface of the cornea well in front of the root of the iris, and (2) by shaping the opening as a narrow linear gap parallel with the corneal margin. Some narrow excisions with knives have already been made (Kalt, reviewed in THE OPHTHALMOSCOPE, October, 1913). The longer the slit or gap, the wider the area of conjunctiva under which the fluid may spread backwards, the freer the diffusion, and the less marked the conjunctival changes.

Quite minute openings, especially perhaps when close to the limbus, may sometimes be seen as dark points in a grey linear scar, possibly with a little localized conjunctival pallor, and with only moderate œdema.

Many surgeons seem still sceptical as to the existence of the true filtering scar. Excellent examples are to be seen after some flap sclerotomies, after some successful orthodox iridectomies, and after some cataract extractions (THE OPHTHALMOSCOPE, *loc. cit.*). The dark grey line indicating the scar is obviously composed of tissue quite different from the adjacent white fibrous sclerotic, and the absolute uniformity of its appearance negatives the assumption of minute openings such as mentioned above.

At the Ophthalmological Society of the United Kingdom in 1911, Mr. Affleck Greeves showed sections of an eye removed two weeks after flap sclerotomy. Filtration was shown by "quite a good area of œdematous conjunctiva,"* but it was insufficient for the advanced secondary glaucoma present. The lens had been removed ten years before by needling for high myopia. The gap between the wound surfaces was occupied by fairly loose fibro-cellular tissue, in which serial sections failed to show any trace of fistulous opening. There can be no reasonable doubt that somewhat similar spongy tissue—? partly a down-growth from loose subconjunctival tissue—accounts for the permanent uniform grey filtering scars seen clinically.

This formation affords ample security against the possibility of late infection, both in the scar itself and in its almost normal conjunctival covering. And the reduction in tension cannot be much overdone, if at all. The tendency is all the other way. The amount of filtration through a short and narrow line of scar tissue is distinctly limited. After one of my flap sclerotomies for chronic non-congestive glaucoma the tension was reduced from 47 mm. mercury only to about 37 mm., although there was unmistakable slight conjunctival œdema about the scar. A second similar operation, 8½ months later, was needed to reduce the tension to normal (17 mm.-20 mm.). A considerable total length of incision, as in the old iridectomy and perhaps in triple flap sclerotomy, or some gaping of the wound to produce breadth of scar, appears necessary for any considerable filtration through actual scar tissue. And much gaping of a quite small incision in glaucomatous eyes (differing from the gaping of the large incision for cataract extraction) tends to fistulization.

Another unfortunate limitation with regard to the true filtering scar is that apparently it is unattainable in eyes with much chronic ciliary congestion, and in many secondary glaucomas. Here incisions tend to heal up absolutely firmly, except where definite fistulous openings are formed.

In the matter of permanency I have seen no special reason to question the strictly filtering cicatrix, but the history of many old iridectomies enjoins caution with regard to expectations of any form of leakage. Late failure may presumably be due to (1) the leakage becoming reduced or (2) advance in the essential glaucomatous changes in the eye, while the filtration remains fixed.

I have had one example of the former after flap sclerotomy, but I doubt if the case was strictly primary glaucoma, and I think the cicatrix was partly fistulous. The eyes showed evidences of old interstitial keratitis, and permanent changes left may have affected the question at issue. Lessening of the filtration œdema, which was at first considerable, preceded the recurrence of tension. The same reduction of œdema is observable in the fellow eye, operated upon by my colleague Mr. W. G. Laws, suggesting that the tension will rise later in that eye also. Mr. Laws has, I believe, had a definite recurrence two years after a flap sclerotomy for primary glaucoma, and I have had to operate again nearly 3½ years after a somewhat imperfect wedge sclerotomy performed for quite early chronic glaucoma. Here the recurrence of tension seemed probably due to advance in glaucomatous changes in the eye, rather than to reduced filtration, as the very moderate œdema present had not become lessened.

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* Personal communication.

Lately I wrote to all the patients on whom I had operated more or less successfully by flap sclerotomy for chronic primary glaucoma two years or more before. The periods since operation ranged up to over five years. I found no evidence of recurrence of tension. There was one rather doubtful tension, 27 mm. mercury, with no conjunctival œdema. But the result had always been doubtful from the beginning. No œdema had developed at any time. The sight however (= counting fingers at 6-8 feet) had not definitely deteriorated.

The following experience suggests that even very free leakage may not always necessarily be permanent :

In October, 1907, I performed wedge sclerotomy for advanced chronic simple glaucoma. The wedge was so far from the limbus that it lay quite free under the conjunctiva. In consequence it became slowly absorbed, thus producing a wide subconjunctival opening and lowering the tension to – 2 or – 3 four months after operation. Gradually, however, the tension rose again with contraction of the opening. Nine months after the operation T. was noted as – 1, and six months later still it was – ½ or normal, at which it remained afterwards. The visual acuteness remained practically the same throughout, 5/36, very slightly improved by glasses.

Risks incurred in Operating for Glaucoma.

I propose to consider only those dangers which have an obvious bearing upon the future of operative treatment.

Late Infection.—At present every attack of iritis or irido-cyclitis in an eye with a leaking scar must be looked upon with suspicion, unless the eye has suffered from similar attacks before operation. We have yet to learn (1) whether the risk of late sepsis is confined solely to cases in which the conjunctival covering has become cystoid or vesicular, and (2) whether the danger is influenced in degree and kind by (? unintentional) inclusion of iris in the subconjunctival opening.

Mr. Priestley Smith, in his report to the recent International Congress in London, mentioned a case of panophthalmitis after trephining. Mr. Norman H. Pike, of Cheltenham, whose case it was, has kindly supplied the following particulars :

Operation on August 17th, 1911, for acute glaucoma in a man of 69 years. Prolapsed iris was incised radially, but none was excised. No iris could afterwards be seen in the trephine hole, but the pupil was slightly elongated upwards. Two months later, there was an œdematous bleb over the trephine hole. T.n., no cupping of the disc. Corrected V. = 6/60. Seven months after the operation, the eye was still sound, but later Mr. Pike heard from the patient's practitioner that the eye had suddenly gone wrong with acute inflammation, pus in the anterior chamber and coming out through the trephine wound. The eye was consequently enucleated.

The following details have kindly been supplied by Mr. A. S. Percival, of Newcastle-on-Tyne, of a case under his care :

Male, 54 years. Trephining for chronic glaucoma on November 17th, 1911, with iridectomy. Sight improved in two or three weeks from less than 6/60 to 6/12 partly. The conjunctiva over the wound became pale and vesicular later. On December 14, 1912, the patient returned with panophthalmitis. The eye had remained well until about ten days before. It was eviscerated.

An old unpublished case of my own is worth recording here. A broad iris-free stoma resulted from a conjunctival infolding operation. After a healthy interval, the eye went slowly to the bad through repeated neglected attacks of iritis. There can be no reasonable doubt that this case was one of late infection :

Hindoo woman, 45-50 years of age. Chronic primary glaucoma. Operation without iridectomy in June, 1901. Placed below the cornea because of an earlier sclerotomy above. The epithelial surface of the infolded conjunctival flap came into relation neither with the anterior chamber nor with the sclero-corneal wound surfaces. There was no suggestion of trouble at the time or soon afterwards. Two months later, the vision had improved from 6/40 to 6/15, but the tension had fallen to —2 or —3, with the development of a rounded fistulous opening and the extreme of vesicular rarefaction of the overlying conjunctiva. The eye was bandaged after emptying the anterior chamber by pricking the glassy conjunctival film, but without definite improvement in the condition.

A little over four months after operation, the first attack of pain and injection, etc., occurred, lasting only a few days and causing purely temporary deterioration of vision. Six months later still, the patient returned with neglected iritis, pupil fixed, V. 6/60, T still —2 or —3. After this, she attended hospital a few times only, and the vision sank further. Finally, the vision was completely lost one year and seven months after operation.

In this country two of my patients have returned with troubles possibly infective, but the attacks were transient.

In both instances the operation was wedge sclerotomy, without iridectomy, for chronic primary glaucoma. In one case iris became incarcerated in the wound, and two scleral openings formed with vesicular conjunctiva. V. improved from counting fingers at 2½ feet to 5/18 partly with + 1 D. Four years and two months afterwards, the patient returned with iritis. A fortnight later, the inflammation had passed off under treatment, but the V. was still only 5/60.

The other patient returned just a year after a quite uncomplicated operation. There was iritis with a small hypopyon. The attack passed off completely within a fortnight, leaving no impairment of the already poor vision (5/60). The cicatrix appeared perfectly satisfactory; there was only moderate œdema and no visible scleral opening, so that it is difficult to believe that there can have been any connection between the operation and the subsequent inflammation. However, the only two inflammatory attacks which I can remember (in India) in eyes with cystoid cicatrices were of the same type—iritis with hypopyon, giving way rapidly to treatment.

Among the fifteen cases of late infection following Sclerectomy mentioned by Axenfeld in the September number of the *Klin. Monatsbl. f. Augenheilkunde*, S. 388, I have particulars of six cases only. Story's case may be placed on one side, as there was prolapse of iris. In all the remaining five, local changes in the conjunctiva over the sclero-corneal opening were well marked. Abrasion or erosion of the conjunctival "cushion" is mentioned in Kuhnt's and Harms' cases; in Schur's case the "cystoid" cicatrix became flattened early in the infective inflammation; and in Axenfeld's case there was a definite flow of aqueous from an abraded point.

The growing number of late septic disasters following sclerectomy in Europe is causing much concern. In so far as the liability is limited to the one eye, an infective loss is not much worse than blindness from unrelieved glaucoma. It has yet to be seen whether a fistulous track is less likely to involve the fellow eye in sympathetic disease when iris-free than when containing iris. If it is not less likely to do so, then the position of trephining is much the same as that of the old irid-encleisis operations,* and it is only a question of time for it to share the same fate.

There are three dangers inherent, and to some extent inevitable, in all operations upon eyes in an advanced stage of glaucoma. The troubles when they come, are probably all circulatory in origin. We have yet to learn how far these risks may be lessened by precautions in operating, such as may ensure quick refilling of the anterior chamber and guard against hypotony later.

(I) *Rapid complete loss of sight*, unconnected with gross hæmorrhage and apparently due simply to the sudden loss of tension in the eye. Of this I have had two instances in this country, one in an advanced buphthalmic eye of a boy of 5 years, the other in an advanced chronic non-congestive glaucoma in a woman of 75 years. The course of events would seem to indicate general vascular stasis and thrombosis, consequent on loss of support to degenerate blood-vessels.

The operation in the former case consisted merely in a subconjunctival puncture near the corneal margin with a 3·5 mm. blade. The uncorrected vision before operation was the counting of fingers at about a foot distance. Afterwards the eye became diffusely injected and very soft and blind. There was no trace of iritis and no pain; the iris became atrophic and pupil widely dilated. No sufficiently early attempt was made to examine the fundus, which was soon obscured by lymph exudate in the deeper part of the vitreous. Later, the softened eye became somewhat shrunken.

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* I must confess that the fear of the old iris-prolapse operations has always appeared to me overdone. My experience as regards late results of these operations, is open to the objection that it is almost purely Indian, and hence possibly misleading. But even in India we have more than once seen sympathetic ophthalmia following prolapse of iris partly or entirely uncovered by conjunctiva, although I have never known it associated with prolapse fully covered with conjunctiva.

In the second case an uncomplicated flap sclerotomy was performed, without iridectomy or iridodialysis. The anterior chamber was partly refilled at the close of the operation, and did not become empty later. V. before operation was only moving bodies. But there was cataract fairly advanced, and projection of light was good in front and outwards. The tension had been reduced by eserine from + 2 to about normal. Afterwards the tension remained −3 for a month or more, and there was ciliary injection. Perception of light disappeared and the pupil became dilated. Finally, over two years later, the tension was 12 mm. mercury, compared with 19 mm. in the fellow eye, which had been operated upon successfully at about the same time for early glaucoma.

I believe that in the more advanced cases of hydrophthalmia it is important to avoid emptying the large and deep anterior chamber. During my later years in India I obtained satisfactory and possibly permanent drainage in some half dozen or more large distended eyes by sub-conjunctival puncture* with a 1 mm. Graefe knife. The patients were mostly adolescent. In no case was the escape of aqueous sufficient to empty the anterior chamber, yet in all there was an alarming early depreciation of vision, generally from counting fingers at various distances to perception of moving bodies. Fortunately this early loss of vision was more than made good afterwards. The patients were all able to see better than before treatment.

I have notes now available of only one of these patients, an English girl of 19 years, born in India (tension possibly secondary to early interstitial keratitis). Seven and a half months after operation, the corrected vision had improved from 4/60 to 6/60. There was definite conjunctival œdema and the scleral puncture was readily visible. In the fellow eye, less advanced in glaucoma, and with coats therefore less thinned, a similar small puncture was made without permanent result.

The invariable temporary fall in vision in these cases could only be attributed to circulatory embarrassment from sudden loss of support to degenerate and weakened blood-vessels. Evidently, however, the stasis was incomplete and passed off as the leakage from the punctures lessened. (Doubtless we are here dealing with the same circulatory difficulty which is responsible for the small fundus hæmorrhages following operation in acute and chronic congestive glaucoma, and for occasional expulsive hæmorrhage, and which probably accounts, in part at least, for the common so-called "quiet iritis" after glaucoma operations).

The impression is irresistible that the eyes were on the brink of disaster, and yet disaster was always avoided. The treatment adopted, being effective, was the maximum permissible. Any larger puncture, such as that which led to the catastrophe in the boy's eye, could have been made only with great risk of the same ending. And if ordinary sclerotomy was inapplicable, how much more was sclerectomy in any form? In hydrophthalmia there can be no operative measure generally applicable, and first attempts must err rather on the safe side. Failure to relieve tension must be risked as the lesser of two evils, always possibly remediable by further operation.

This Indian experience seems to me to have a value beyond the mere demonstration of an apparently safe and efficient means of treatment for a few eyes otherwise almost beyond treatment. For here at least one must take a definite stand against the indiscriminate advocacy of sclerectomy. The evil of unnecessary and prolonged reduction of tension is here indisputable, while the loss of sight recorded in the adult case of ordinary chronic glaucoma is a useful reminder that the danger is not confined absolutely to any one class of case or to one kind of operation.

(II) *Permanent partial loss of vision*, unconnected with hæmorrhage or cataract formation, and due to the sudden reduction of tension. This probably represents merely a minor grade of the circulatory difficulties which lead to the total loss of vision just dealt with. Gilbert* has recently collected a number of cases, some of which at least apparently belong to this group. It is only since the Schiötz tonometer has come into extended use that one can look for the general recognition of these cases.

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*Both puncture and counter-puncture were made, but usually, if not always, only one of the small openings remained patent.

There is no doubt that many transient early reductions in vision occur after glaucoma operations, unaccounted for by delayed refilling of the anterior chamber or by "quiet iritis." They commonly pass unnoticed, being usually much less striking than in my juvenile cases mentioned above. It is only perhaps reasonable to expect that recovery from this early impairment of sight may at times be imperfect or wanting, more particularly where prolonged hypotony is occasioned by the operation.

(III) *Hæmorrhage.*—In one case where I thought that over-free filtration may have been partly responsible for late fundus hæmorrhage and subsequent subacute glaucoma after flap sclerotomy, tonometric confirmation was lacking owing to the distance at which the patient lived.

The Present Position.

The practical application of the foregoing is obvious. The appeal for conservatism is strong. I believe that the deliberate fistulisation of eyes is wrong in principle, except in the types and stages of glaucoma in which true filtration is found to be unattainable or ineffective. In some hard painful chronically congested eyes, with vision generally poor, and in many secondary glaucomas, the establishment of a wide open sub-conjunctival stoma is apparently the only possible means of keeping the tension low. Here one has to make the best of a bad position. The choice lies between the risk of late infection, such as it is,† and certain blindness (if it is not already present) possibly with removal of the eyeball for the relief of pain.

To go to the other extreme, there are many eyes in which I believe intentional fistulisation will very soon be generally regarded as unjustifiable. These are (1) very advanced hydrophthalmic eyes, least able to bear hypotony ; (2) quite early chronic glaucoma (operation being necessitated or warranted because of imperfect control by myotics, or because of conditions unfavourable for regular observation), and (3) chronic simple glaucoma with only slight elevation of tension, though possibly with much contraction of field of vision. In groups (2) and (3) single flap sclerotomy has given perfect filtering cicatrices, sufficient, but not more than sufficient, for the very limited filtration required. Here the high quality of vision at stake renders the incurring of unnecessary risk particularly unjustifiable, while in the eyes with very contracted fields the risk of loss of sight has always been regarded as exceptionally great.

Since the natural tendency of sclerotomy appears to be towards true filtration, while the tendency and avowed aim of sclerectomy is towards fistulisation, it seems likely that the former will be found to give better results in the great bulk of eyes affected with primary glaucoma, but still retaining useful vision. The development of sclerotomy has been slow because of the relatively limited material at the command of its supporters. Its rival, sclerectomy, has forged well ahead in general estimation and adoption largely through the exceptional opportunities, energy, and enthusiasm of Lt.-Col. Elliot. Also the immediate claims of sclerectomy are the more obvious and pressing. Operators have naturally been highly pleased by the ease and regularity with which tension could be reduced. Now the very difficult task of graduating the result to the needs of the case must be taken up more generally.

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* v. Graefe's *Archiv für Ophthalmologie*, LXXXII, 3.

† Reducible, as suggested in footnote on page 2, by excising a long narrow strip of sclero-corneal tissue, rather than the rounded disc of the trephine hole.

With Priestley Smith, I agree that my wedge sclerotomy has received less attention than it deserves. Its particular merit is that it affords a fairly accurate means of graduation to the needs of widely differing cases. The permanent remains of the wedge must contribute to protection of the eye against late sepsis. Unfortunately many surgeons found the *technique* difficult. It was on this account alone that I gave up the method, needing all my somewhat scanty clinical material in the attempt to develop an easier operation.

In the reaction from sclerectomy, triple-flap* sclerotomy is likely to be fully tested. It is possible that in the single and triple flap operations we have the nearest approach to the ideal operation, which can be expected for some little time. The triple flap modification removes much of the earlier reproach of frequent failure, which the single flap method earned in some hands. Operating under an Elliot corneo-conjunctival flap, the primary incision with 3·5 mm. broad needle, placed nearly perpendicularly to the surface, may be made well up to the limbus. Probably the resulting filtration may be varied easily with the position of this puncture.† Otherwise the result may prove excessive in the groups of cases above mentioned, which require very limited filtration. On the other hand the method cannot take the place of sclerectomy in some secondary glaucomas, and in some primary chronic congestive glaucomas, for even single flap sclerotomy has sometimes produced a partly fistulous cicatrix.

The Ideal Operation.

The ideal operation must provide a linear filtering cicatrix, or the nearest possible approach to it, with a minimum of risk. (This statement scarcely applies to advanced chronic congestive glaucoma.) What is required ordinarily is a simple linear puncture, parallel with the corneal margin, in some way kept from healing firmly. Iridectomy, being needed only to keep the iris free from the wound, should be avoidable at least in cases where the anterior chamber is not exceptionally shallow and where the pupil can be kept fully contracted by eserine. Interference with the iris may tend to add directly in slight degree to the vascular disturbance produced by the operation, also indirectly by necessitating freer instillation of cocaine and adrenalin.

To obviate the tendency to iris complications when iridectomy is omitted, three precautions seem advisable : (1) the placing of the incision as far forward as possible, more particularly as regards the deep surface of the cornea, (2) using such means as are available to promote early re-filling of the anterior chamber, and (3) a restricted use of cocaine and adrenalin, which together tend to dilate the pupil in spite of eserine instillation. Very early re-formation of the anterior chamber is desirable, also, to lessen the risk of loss of sight from sudden complete loss of tension.

Lately I have in a few cases obtained moderate filtration through a sub-conjunctival puncture kept open for a day by means of a metal plug. The latter is laid upon the conjunctiva and fixed by conjunctival sutures in position, pressing the conjunctiva before it, so that it dips into the puncture. The anterior chamber may not be emptied at all, or, if emptied, refills at once. But the method is still somewhat troublesome, and apparently only moderately effective, so that it is as yet unsuited for cases with much increase of tension. It is based upon some old conjunctival infolding operations. To increase the effect in two cases, I have made the sclero-corneal opening, not simply by incision, but by stretching a small puncture with a dilator. This stretching of a puncture alone, without any conjunctival infolding, has been quite effective in some cases. But the result has been uncertain, and the tendency appears to be rather towards fistulization than towards true filtration.

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*THE OPHTHALMOSCOPE, Vol. XI, 398, July, 1913.

†Placing the primary incision very close to the limbus, possibly at the limbus, making the lateral incisions then almost purely corneal, must restrict filtration.

(FROM THE INSTITUTE OF PHYSIOLOGY, UNIVERSITY COLLEGE, LONDON.)

DICHROMIC VISION.

BY

F. W. EDRIDGE-GREEN, M.D., F.R.C.S.

I APPLY the term dichromic to those who have only two definite colour sensations and white. When examined with a bright spectrum they say that they see only two colours there. In the same way I use the designations trichromic, tetrachromic, pentachromic, hexachromic and heptachromic for those who see in the bright spectrum three, four, five, six or seven colours. Those examined behave in every way as if they only possessed the number of colour sensations indicated.

It must not be supposed that I consider that a man who stated that there were more colours in the spectrum than two was necessarily not dichromic. It will be seen from the cases I have given that many dichromics have applied different colour names to the various divisions of the spectrum. This only occurs when the examinee has some idea of the region presented to him. The presence of a neutral area, the confusion of red, yellow and green with each other, and purple with green and grey are diagnostic of the dichromic. The trichromic see three definite colours in the spectrum, red, green and violet and say that the spectrum is red, red-green, green, green-violet and violet; they have no neutral point, they mark out a greater number of monochromatic regions than the dichromic, they only in conditions of special difficulty confuse red and green and they see purple as a definite colour and do not in ordinary circumstances confuse it with grey or green.

Many of these cases have been described under the name of anomalous trichromatics. I have, however, described[1] trichromic cases which had all the symptoms attributed to the anomalous trichromatics, but they were not anomalous trichromatics, as they made an absolutely normal match. There were also many who make an anomalous colour equation and yet present no sign of colour blindness.

All authorities are agreed that the cases which I have designated dichromic have dichromic vision, but there is considerable difference of opinion on most of the essential details, and as to the nature of the defect.

I propose to examine a number of the main facts of dichromic vision, and consider how far they fit in with pre-existing views.

It should be noted that I use the above criterion for the diagnosis of cases of dichromatism, and that I do not regard the matching of colour mixtures as a reliable method of distinguishing these cases. I consider it totally wrong to assume because the mixing of two colours gives rise to the appearance of a third colour, the sensation of that third colour is due to a similar mechanism. It is true that all the cases which I describe as dichromic also appear as dichromic on colour-mixing methods, that is to say, all colours may be matched by proportional mixtures of two selected spectral colours taken from the two ends of the spectrum and white. There are, however, border-line cases in which the observer will see three definite colours in the spectrum, red, green, and violet, when this is bright, but only two when it is of low luminosity. He will be dichromic in all conditions of difficulty in colour discrimination, as with feeble unsaturated colours occupying a small visual angle. In favourable conditions, as with luminous colours of full saturation occupying a large surface, he will be trichromic. In a case of this kind a dichromic colour match which is good for a small area is not true for a large area of precisely the same colour—a distinct colour difference is then seen.

All dichromics are not equally colour blind.

A fact that seems to have been generally overlooked is that the colour blindness found in dichromic vision is a defect of hue perception, and that it is this defect of hue perception which causes the characteristic symptoms of colour blindness.

It is quite possible to suppose that a person might have only two colour sensations, and yet being able to tell the least difference between the mixtures of these sensations, have a hue perception which, though not similar to the normal, was quite sufficient for all practical purposes.

The colour vision of the dichromic varies from those who have a colour perception bordering on the trichromic, to those who are almost totally colour blind. It is obvious that a man who cannot see the least difference between the colour of the red and that of the green signal on the railway line, except when one is changed to the other, has a colour perception which is more defective than that of the ordinary dichromic. Although I have never found a dichromic who had a hue perception equal to that of the trichromic, I have examined many who possessed a hue perception which was nearly equal.

It is on account of the varying hue perception possessed by different dichromics that their detection by the tests in use is so variable. One dichromic will pass all but the most stringent tests, whilst another will fail with a very inefficient test. The degree of colour blindness is also influenced by the state of health of the observer. A dichromic who will pass a test in his normal condition may fail when greatly fatigued or suffering from an illness.

The fact that one dichromic makes so many mistakes that he is readily detected by his acquaintances, and another may become a Royal Academician without his colour defect being suspected, illustrates the difference in hue perception which is found with different dichromics. I have examined some of the pictures painted by a dichromic Royal Academician, and was quite unable to detect any defect. This shows how accurately he was able to match. His daughter told me that her mother used to give him the correct colours. An artist was sent to me lately because the head of the academy at which he was studying said that he was painting his pictures too coldly, and he thought there must be some slight defect of colour perception. On examination I found that he was a dichromic, with slight shortening of the red end of the spectrum. He saw two colours, red and violet, in the bright spectrum. He brought a number of his pictures for me to examine, and the only fault which appeared specially noticeable was that the pictures appeared too cold, they did not appear to have enough red in them. I noticed that the predominant colours in his pictures were red and violet. This artist had passed through his artistic career without suspecting that he was colour blind, or any of his fellow students suspecting it, whilst they detected a slight defect of light perception, which is common in those who have hexachromic vision. He was intensely surprised when I told him that he only saw two colours instead of the normal six. This illustrates the point that those dichromics possessing a defect of light perception are much more readily detected than those who have uncomplicated dichromic vision bordering on the trichromic.

All dichromics, when examined with my spectrometer will say that they see only two colours in the spectrum, but they vary very considerably as to the size of the portion of the spectrum, which when isolated appears monochromatic ; one dichromic will declare that he sees only two colours in the spectrum and each of these colours is quite uniform, differing only in luminosity ; another will say that the whole of one colour is monochromatic until the neutral point is nearly reached, that is to say, he sees several differences of colour in the neighbourhood of the neutral region.

It will be noticed, therefore, that dichromics vary as to the position at which they see an element of their second colour coming in, those dichromics who are bordering on the trichromics usually see about eight distinct differences in the spectrum, that is to say, one sensation appears to overlap the other considerably ; green, for instance, is designated as a much less saturated colour than the red ; a man of this kind will see a very definite difference between red, yellow, and green, and therefore be able to match very accurately when only the primary colours are taken.

One of my dichromic cases, for instance, holds the record for matching sodium yellow with a mixture of thallium green and lithium red. He made the ordinary normal match, but in making a number of observations he had less mean deviation than any other person I have examined, normal-sighted or otherwise.

Limits and Position of the most Luminous and Neutral Regions in the Dichromic.

The following is a series of cases examined with my spectrometer ; they are not selected cases, but all the cases examined by me during a short period and in precisely similar conditions. The eye was light adapted, the illumination 180 meter-candles, the size of the slit was the same, and the kerosine used was taken from the same supply. The spectrometer was also kept unmoved during the whole of the period.

The following are the centres of the areas of greatest luminosity and the neutral regions in the dichromic cases which were examined in similar conditions :

	Commencement of Red.	Termination of Violet.	Centre of most luminous region.	Centre of neutral region,
1.	724 $\mu\mu$	436 $\mu\mu$	610 $\mu\mu$	509·5 $\mu\mu$
2.	780	409	573	498·3
3.	775	416	619·5	509·5
4.	680	420	566	493
5.	780	395		500
6.	735	414	–	509
7.	675	410	561	505
8.	700	412	598	502·4
9.	690	421	586	501·5
10.	635	415	—	503·8
11.	718	406	570·5	491·9
12.	665	429	589·5	496·6
13.	730	410	605	502·4
14.	675	413	582	497
15.	743	400	593	507·5
16.	710	412	555	490·5

It will be noticed that the point of greatest luminosity for the five cases in which the spectrum is longest at the red end is on an average 600. König[2] found that it was 605 for five normal sighted persons. I find, like König, that though the neutral point is usually nearer the violet when there is shortening of the red end of the spectrum, this does not form a means of distinguishing between these cases. It will be seen that cases of all kinds are found, from those who have a spectrum of normal length to those who have considerable shortening of the red end of the spectrum.

All those who made the observations just recorded were accurate observers, and the examination with the spectrometer gave a key to their colour vision.

Extent of Monochromatic Areas in the Dichromic.

The following series of cases was examined by my spectrometer in the manner I have described.[3] Each observer is told to pay attention only to differences of hue and saturation, and not at all to differences of luminosity. A portion of spectrum which occupies the whole of the field is first shewn so that the observer may have no clue as to the position of the colour shewn him. The point to note specially is when the first trace of the second sensation is found mixed with the first. The number of regions marked out as monochromatic does not by itself give the degree of colour perception of the observer. For instance, the first dichromic given has marked out 11 regions, but it will be noticed these are all in the neighbourhood of the neutral region, and it was not till this region was nearly reached that he noticed a colour difference.

All the cases were examined in similar conditions, the eye being light adapted in each case, and the luminosity 180 meter-candles. The first column gives the number of regions distinguished, the second the wave-length in millionths of a millimeter, the third the size of the monochromatic region in millionths of a millimeter, and the fourth the colour name given to the region. In every case there was no doubt about the dichromic vision, and all had when examined with my lantern[4] confused red, green and yellow in appropriate conditions.

1. No. of Regions.	λ	$\delta\lambda$	Colour Name.	2. No. of Regions.	λ	$\delta\lambda$	Colour Name.
1	724 518	206	Red	1	780 675	105	Red
2	518 514	4	Yellow	2	675 634	41	Red
3	514 510	4	Yellow	3	634 534	100	Yellow
4	510 507	3	Yellow	4	534 512	22	Yellow
5	507 504	3	Yellow	5	512 501	11	Yellowish
6	504 500	4	Green	6	501 496	5	No Colour
7	500 497	3	Green	7	496 490	6	Blue-Green
8	497 495	2	Green	8	490 482	8	Grey-Blue
9	495 491·5	4	Green	9	482 409	73	Blue
10	491·5 482	9	Blue-Green				
11	482 436	46	Blue				

Length of Spectrum
288

Length of Spectrum
371

(*To be concluded.*)

A CASE OF PANOPHTHALMITIS CAUSED BY BACILLUS SUBTILIS FOLLOWING A CATARACT EXTRACTION.

BY

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Introduction.

CASES of serious infection of an eye after operation ending in suppuration and panophthalmitis are now so uncommon that every example should be carefully investigated and recorded. Thus, Haessig,[1] of Basle, had no suppuration among his last 500 cases. Kitamura[2] found no case in 112 extractions from diabetic patients. Uhthoff,[3] of Breslau, experienced no suppuration in 100 diabetic cases. Elliot,[4] extracted 1000 consecutive cases with a septic incidence of 1·06. Haab[5] gives the percentage as 1 to 2 per cent., and emphasises the fact that a list of 100 or even 200 extractions without a suppuration proves nothing, and quotes Arlt[6] as saying that the most experienced and careful operator will encounter every complication if only he goes on long enough. Probably 1 per cent. would be a good figure for work done in eye hospitals under the best conditions, whereas it might rise to 2 per cent. in general hospitals, where the air is more loaded with pyogenic organisms, and where the risk of contamination by nurses who have to dress septic cases must be greater. My own percentage is somewhere in the neighbourhood of 1 per cent.—two cases in about 200 extractions.

My first case illustrates the well-known fact that if one eye has suppurated, the other may do so too. An Arab woman had her cataract extracted by my colleague at the British Ophthalmic Hospital, Jerusalem, Dr. W. E. Cant. The operation was followed by panophthalmitis. Some years later I tried to extract the second lens after preliminary iridectomy. It became dislocated into the vitreous, and I failed to extract with the vectis. Three days later, although I had adopted every aseptic precaution known to me, acute panophthalmitis set in.

Before detailing my present case I may shortly describe my method of conducting the operation.

The patient's eye is douched out three times a day with a solution of mercuric oxycyanide, 1 in 5,000, from the day he is admitted up to the day of the operation. Unfortunately, I have so few beds that this period is generally a short one (one to three days). This treatment was recommended by Mayweg,[7] at the Heidelberg Congress, who stated that he only had one infection in his last 200 cases. V. Liebermann[8] and Lengyel recommend a 1/10,000 solution, and claim that it generally renders the conjunctival sac sterile in two or three days.

The lacrymal sac is always syringed out to detect any abnormality, such as obstruction or dacryocystitis. If such be present, the sac is excised before the cataract is extracted, and in any case which is not apparently normal, cultures are made, and no operation is performed until the conjunctival sac is sterile, or yields only a few scattered colonies of staphylococcus albus. Four instillations of cocain, in four per cent. solution, which has been sterilised by boiling, are made at five minutes' intervals up to the time of operation. The first instillation is combined with one of solution of eserine one per cent. The eyebrow is shaved.

On the table the lids and lashes are well rubbed with ordinary soap and then with a pad dipped in a solution of biniodide of mercury in spirit, 1/500. The excess is squeezed out, so that none of this lotion can enter the eye. The lashes are cut short with scissors moistened with sterilised paroline to catch the cilia as they are cut off, and the eye well douched out with a solution of oxycyanide of mercury, 1/5000. I, and all my assistants, wear a mask which covers the whole head and face except the eyes. The patient's face is covered with sterile gauze. A preliminary iridectomy is now made. The keratome is entered exactly at the limbus, a small incision is made, and a very narrow but peripheral coloboma cut. I often use Matthieu's (Liebreich's) forceps for seizing the iris. After from one to three months, or later, according to circumstances, I proceed to extraction. I employ the three mm. flap incision, usually with a conjunctival flap. I always try to make an incision with a single sweep of the knife, the *Einzugige Starschnitt*, which is so highly praised by Schmidt,[9] of Wilhelmshaven. The eye is dressed after forty-eight hours and atropine instilled. I generally employ the double bandage for four days. I find no difficulty in obtaining a conjunctival flap after preliminary iridectomy, because my incision for iridectomy is in the limbus and in front of where the extracting section cuts the conjunctiva.

Case.

Wm. M., aged 65 years, a coal loader at the gas works, came to the Warneford Hospital, Leamington, on December 8th, 1910, complaining that he had been gradually losing his sight for four years. He contracted syphilis when a young man. On examination, he was found to have R.V.=bare hand reflex, L.V.=hand reflex. Perception of light and projection good. The pupils reacted to light very sluggishly. There was a small pterygium on the right side.

There was a general haze of the lens on each side, with dense nuclear opacity. There was a red reflex on the right side, but no fundus details could be seen. The periphery of the left retina was seen dimly; large masses of pigment were present, there was an anterior choroiditis almost certainly syphilitic in nature. There was a suggestion of white patches of atrophy, but nothing could be seen clearly. There were small floating opacities in the vitreous.

September 24th, 1911.—Vision as before. Cataract not yet mature in either eye. Patient has pyorrhœa alveolaris.

February 29th, 1912.—Right eye now ready for operation. A culture was made, and a copious growth of *staphylococcus albus* grew. Patient was admitted, and the eye douched out with oxycyanide of mercury solution (1-5,000), until the conjunctival sac was sterile.

March 2nd, 1912.—A second tube of blood serum was inoculated. No growth appeared. A preliminary iridectomy was now made, and was followed by no reaction. A good coloboma was obtained.

July 15th, 1912.—Patient's eye has been douched out with the oxycyanide solution. The lens was extracted by single stroke incision with short conjunctival flap. No complications. The only instruments introduced into the eye were knife, cystotome, and repositor, all of which had been boiled. None of the instruments touched the lids.

July 16th.—Eye dressed by the house surgeon, who reported that there was no unusual injection; the wound had closed, and the anterior chamber reformed.

July 17th.—The eye is inflamed and rather painful.

July 17th.—Much chemosis. Some lymph on wound but no pus. There is some soft lens matter in the anterior chamber, which was not noted at the operation, but which was present yesterday. A tube of blood agar was inoculated from the lymph on the wound, as well as from the conjunctival sac. Nothing grew. An injection of 10 c.cm, of antidiptheretic serum was given..

July 22nd, 1912.—Chemosis less, pain less, much injection. The lens matter in the coloboma has now a yellowish tinge.

Jnly 27th, 1912.—The eye is in a state of mild panophthalmitis.

Blood count:— 9,000 leucocytes per c.mm.
84 per cent. polymorphonuclears
1 per cent. eosinophils
4 per cent. small lymphocytes
11 per cent. large lymphocytes

A second series of tubes of blood agar, blood serum, and simple agar was inoculated from the wound and conjunctival sac, but no growth was obtained.

Aug. 2nd, 1912.—The eye was excised.

Bacteriological Examination.

When bisected it was seen that there was a collection of pus in the vitreous and a track of pus led from the wound to the vitreous.

Tubes of blood serum and agar were inoculated from this pus, and three organisms were separated: (1) a copious growth of *staphylococcus albus*, (2) a few gram-positive rods with the morphological characteristics of *bacillus subtilis*, (3) a small gram-negative bacillus.

The further examination of the cultures was kindly undertaken by Mr. D. Embleton, Bacteriologist to University College Hospital, London, who sent the following report :—

"There is a subtilis and a staphylococcus present on the agar tube and a Gram-negative rod on the serum. The staphylococcus is a pyogenes, it gives in pure culture the following reactions : —Liquefies gelatine, forms acid and clot in milk, gives an acid reaction on mannite."

The Gram-negative rod is an intestinal type of organism, since it grows well in the presence of bile salts, giving a good growth on Rebipel, but no clouding nor acid. It sometimes gives a slight acid in galactose, but nothing in glucose, lævulose, maltose, lactose, saccharose, raffinose, dulcite, adonite, saiacine, inulin, ramnose, xylose, sorbite, mannite, glycerine, erythrite, milk, peptone water for indol, Voges-Proskauer reaction and gelatine.

The Gram-negative rod is an unknown factor, but we have noted a somewhat similar organism in a suppuration of unknown origin in the loin. Here it was superficial and in pure culture."

Comments,

To sum up then : three organisms were isolated from the vitreous, namely, bacillus subtilis ; staphylococcus albus ; and a Gram-negative bacillus of intestinal type.

The first of these organisms has obtained an unenviable notoriety as an insidious cause of vitreous suppuration. Axenfeld[10] devotes several pages to the subject of subtilis infection, and we would refer the reader to him for the detailed bibliography of the subject. He states that Haab and Paplawska were the first to isolate subtilis from a case of panophthalmitis caused by a splinter of wood, but attempts to cultivate it failed. In 1902, Silberschmidt[11] shewed that these so-called panophthalmia bacilli were really a form of subtilis, one which is found in earth. Kayser confirmed these researches.

The subject has also been investigated experimentally. Axenfeld tells us that Perles and Lohman obtained only slight and ephemeral irritation by inoculating the cornea, the anterior chamber, and the vitreous of rabbits with subtilis. Bänziger and Silberschmidt, on the contrary, produced a panophthalmitis by injecting subtilis culture into the vitreous of rabbits. Axenfeld himself has obtained both these results—slight or severe infection according to the strain of subtilis employed.

Bacillus subtilis soon disappears from the interior of the eye. According to Silberschmidt, it cannot be detected in the vitreous three days after inoculation, a statement confirmed by Stregulina and Sidler. Kayser failed to find the bacilli after seven days. In general, no spore formation takes place in the vitreous. If subtilis spores are introduced into the vitreous, there is no latent period, as one would expect, for Ulbrich found that they at once give rise to vegetative forms.

Axenfeld (*loc. cit.*) draws attention to the fact that subtilis is, in general, non-pathogenic for the cornea, even when cultivated from highly virulent strains which have caused panophthalmitis. There are, however, exceptions. Thus, zur Nedden[12] found a pure culture of *bacillis subtilis* in a corneal ulcer. Lutz[12a] describes cases of panophthalmitis from *subtilis* infection. Gourfein[13] found *bacillus subtilis* seventeen times in persons suffering from acute conjunctivitis. Bietti[14] records a case of panophthalmitis following a wound of a child's eye which was caused by *bacillus subtilis;* he also obtained it in pure culture from a hypopyon-ulcer, thus confirming zur Nedden's finding in a similar condition.

Cramer[15] recounts a case of a boy who fell against a hedge, a thorn became implanted in his lid, and an orbital abscess formed. The pus contained *B. subtilis* in pure culture. No suppuration occurred in animals inoculated with the culture, but if small pieces of wood were infected with the organism, and placed under the skin, an abscess formed.

We may, I think, take it as proved that certain strains of *bacillus subtilis*, especially earth forms, are highly pyogenic when they obtain access to the vitreous, and that they may cause suppuration in other situations. The *bacillus subtilis* has been shown, also, to cause conjunctivitis and hypopyon-ulcer of the cornea.

The case against *staphylococcus albus* is not nearly so clear.

Axenfeld [16] states that *staphylococcus pyogenes albus* is very rarely found in the conjunctiva, there are several other varieties of the *staphylococcus albus* and most of them are avirulent. Most strains will not infect a rabbit's cornea and cannot infect a wound, but under certain conditions, when the resistance of the tissues has been reduced, they may cause infection. Probably, the following organisms are really identical: *Coccus albus non-liquifaciens* (Fick), *Staphyloccocus epidermidis albus* (Morax, Griffith, Jackson, Lawson), *Staphylococcus habanensis* (Santos-Fernandez), *Micrococcus epidermidis albus* (Randolph), *Staphyloccus brevis* (Griffith), *Micrococcus amplus* (Gromackowski), *Micrococcus candicans* (Fick, and others).

Most of the cocci called *S. pyogenes albus* are also identical with the above group, and usually, in Axenfeld's opinion, they are all harmless saprophytes. Mayou[17], however, disagrees with Axenfeld, but gives no cogent reasons for his view apart from *a priori* arguments which must necessarily carry little weight. He, however, insists upon the dangers from subtilis infection.

Hancock[18] cites three cases of post-operative infection, in two of which a pure culture of *staphylococcus albus* was obtained from the aqueous humour. The third reacted well to staphylococcus vaccine.

Bietti[19] confirms Tschiskowsky's results, finding that *staphylococcus albus* *non-liquifaciens* is able to cause exudates in the pupil of a rabbit operated upon for cataract. He believes, however, that in man post-operative infection with this organism must be rare, and thinks it is safe to operate when a moderate quantity of the cocci are present in the conjunctival sac. Personally, I have done so on three or four occasions, with no evil result. One of my patients slit her cornea up from top to bottom with a pocket knife with which she was cutting the "frog" of a pony. A large prolapse had to be excised, and a second operation performed to remove a secondary prolapse of the iris. Perfect healing resulted with V. + 7 D. cyl. axis vertical = 6/18. A culture made from the knife contained *bacillus subtilis* and *staphylococcus albus*.

Gram-negative bacilli of the coli group have been found in the pus from dacryocystitis (Mircoli, Uhthoff, and Mazet); in pus from the orbit (Löser); in hypopyon-keratitis; and, finally, by Randolph[20] in panophthalmia.

All the three organisms, therefore, which were isolated from my case have been found in cases of panophthalmitis, but the *bacillus subtilis* is the only one which is now universally recognised as a cause of this disastrous complication of operations upon the globe. Axenfeld and others regard the *white staphylococcus* as harmless under ordinary conditions, but probably it is not so in a mixed infection. *Subtilis*, too, is more apt to cause inflammation in an eye which has a low resisting power, and probably is more dangerous in a mixed infection. The *bacillus coli* probably had little to do with the infection.

In my case there had been syphilitic infection, which had left masses of pigment near the ora serrata, and this fact may have lowered the resistance of the eye to subsequent infection.

The source of infection is difficult to trace with any certainty. It must have had one of three sources, viz., the conjunctiva, the cocaine, or the knife. The other instruments used had all been boiled for a long time.

The conjunctival sac was swarming with *staphylococcus albus* before the preliminary iridectomy. After treatment with mercury oxycyanide it became sterile, and not a trace of inflammation followed the operation. We failed to obtain a trace of growth from the conjunctival sac or wound surface after the operation, and so infection from the conjunctiva may almost be excluded, and yet the presence of *staphylococcus albus* before the first operation in the vitreous is at least a suspicious circumstance.

The cocaine had been brought to a boil, and was well washed out of the eye before operation, and so is an unlikely agent.

The knife alone remains. I always sterilise my Graefe blade by holding it for two minutes in a shaving pot (Snell's) of rapidly boiling water, and have always regarded this as sufficient. Longer boiling might possibly injure the edge, and yet I use the same knife for several operations, and have not noted any loss of sharpness after boiling. Schmidt,[21] who has made microscopic examinations of the edges of Graefe knives which have been boiled, finds that if the knife be placed in cold water and brought to a boil, it is annealed, and its edge shows no alteration, even after subsequent boilings in water at 100°C. But if a new knife be plunged at once into boiling water, its edge shows fine serrations; in other words, it is damaged by the process. Probably the French method of sterilisation by dry heat, which does not exceed a certain temperature, is the best, but the apparatus is a little costly. In any case *none of these methods is capable of dealing with the spores of bacillus subtilis*, which, as we all know, are excessively difficult to kill. According to Axenfeld, they are only destroyed by three hours' boiling. Gunter[22] states that the spores are extraordinarily resistant (*ausserordentlich resistent*).

The logical conclusion of the case is that the panophthalmitis was caused by an infection with the spores of *subtilis*, probably introduced by the knife.

It was likely that the secondary infection with *staphylococci* and *bacteria coli* had some connection with the conjunctival flora, although we failed to grow them from the cul-de-sac.

This being so, it seems impossible to avoid these cases, for the spores are practically immune to our methods of sterilization. The knife was taken directly from boiling water and used at once; it did not touch the lids; and the cilia had been cut short.

[I wish to express my thanks to Dr. Embleton for his careful determination of the exact nature of the micro-organisms, and to my house surgeon, Mr. J. W. Smith, for making the preliminary cultures from the eye].

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ON THE TECHNIQUE OF EVISCERATION.

BY

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SOME years ago I wrote a paper advocating a simple evisceration as opposed to the current practice of doing an evisceration *plus* a keratectomy. The operation, as I performed it at that time, consisted in evacuating the contents of the globe through a large angular scleral opening above the cornea, leaving the latter intact. This gave decidedly less reaction than the old operation, and the stump also was, on the average, superior to that previously obtained; but in many cases the shrinkage was so great that the final result was not much superior to that obtained by the old method of evisceration or by an enucleation.

This led me to apply the same principle in performing a modification of Mules' operation, and for several years I did a *Mules' operation without excision of the cornea* with much satisfaction, until I had a case in which this operation was followed by sympathetic ophthalmia, ending finally in total blindness.

This gave me such a set-back that I abandoned the Mules' operation entirely.

The sequence, however, is so rare, that while I feel unable to recommend any operation that involves putting a foreign body into the scleral cavity or the orbit, unless the patient understands that it involves a slightly greater risk, I can hardly expect others, who have done such operations many times without a bad result, to pause in their career. I therefore recommend to any who prefer to do some variety of the Mules' operation, the operation without keratectomy. It is performed as follows.—The conjunctiva is first freely dissected back from the cornea, the globe is then opened by a scleral incision extending from a point a little above the insertion of the internal rectus to a corresponding point above the external rectus, the cut passing about halfway between the attachment of the superior rectus and the upper margin of the cornea.* The contents of the globe are then carefully scraped and swabbed out; a good-sized glass ball is introduced. The scleral wound is closed with a continuous silk suture. The conjunctiva is drawn over the cornea with a tobacco pouch suture, and a compression bandage is applied.

When the conjunctival suture is removed, after five or six days, the conjunctiva slides back and becomes reattached at the corneal margin. The scleral suture is not removed unless the knots cause irritation later on. On account of the larger size of the cavity thus left, this operation has the advantage over the ordinary one that, with a given sized ball, the scleral scar has a longer time to become firm, before the inevitable contraction of the sclera begins to pull on it. It might be thought that the exposed cornea would be so sensitive as to interfere with the wearing of the glass eye, but this is not the case; with the ciliary body removed, the cornea thickens, loses some of its transparency, and becomes hardly, if at all, more sensitive than the surrounding conjunctiva.

In the cases where, on account of active infection or destructive wounds or ulceration, it was not possible to save the cornea, the following method was employed to cover the scleral suture completely.—The long horizontal wound made by excising the remains of the cornea and a triangular bit of sclera at each side of it, having been closed with silk, the conjunctiva below is dissected off and pushed down so as to leave the sclera bare for a space about 3/16ths of an inch wide. The conjunctiva is then slid down from above and anchored to the lower margin of this exposed area by sutures going half-way through the sclera. This covers the scleral suture completely, and if the wound should break open (something which has never occurred in my experience) the ball would be extruded beneath the conjunctiva instead of into the open air.

But as my unfortunate experience has compelled me to renounce Mules' operation in all its forms, except where the patient specifically accepts a slight increase in risk for a slight cosmetic advantage, the operation which I commonly perform as a prophylactic against sympathetic ophthalmia is the following :—

Simple Evisceration.

The cornea is cut across, but is not removed, by an incision which extends 1/4th inch into the sclera at each side. The contents of the globe are scraped out, the utmost care and vigour being used in the ciliary region and at the entrance of the nerve. The interior of the cavity is then carefully and vigorously rubbed out with several somewhat globular gauze swabs. The cavity is then irrigated with a good strong stream of sterile boric solution. The anterior half of the sclero-corneal wall is then pushed back against the posterior half with a good sized globular gauze swab dipped in sterile oxide of zinc ointment. Lastly, a compressive bandage is applied. The swab is removed after forty-eight hours.

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*The scleral incision can be made in various ways. I first made a long meridional cut with a short one at right angles to the anterior end, but I believe the incision described above is preferable on account of the greater ease with which it enables the interior of the globe to be examined. The idea of leaving the silk suture in place was suggested to me by Dr. Frank Allport. A catgut suture might suffice, but the silk offers a more certain guarantee against a re-opening of the wound.

I was led to adopt this method of flattening out the wall of the globe by the observation which I made while doing Mules' operation. I found that where I used a ball of not much more than 1/2 inch in diameter, the resulting stump gave a poor cosmetic effect, beside making it extra hard to find a shell that would do at all. The round lump in the centre, while much larger than that obtained without the ball, gave no support at the periphery of the conjunctival sac and hence did very little towards preventing the sinking in of the tissues below the orbital margin, which is the main cause of the disfigurement seen after eviscerations or enucleations. Therefore, when I returned to the simple evisceration, I tried to make a stump that would give support to the edge of the glass eye, and the pushing together of the anterior and posterior walls does this. The stump generally obtained is a large flat disc, which gives, as a rule, an extra good appearance to the artificial eye. The vigorous scrubbing out with gauze seems to cause more reaction than when a spoon alone is used, but the extra assurance which it gives of not leaving any uveal tissue in the cavity, makes it highly desirable. As a further safeguard in cases in which the original wound has caused uveal tissues to become incorporated in the sclera or cornea, any such area is excised.

This operation, beside giving a superior cosmetic effect, is so simple that it can be done by a surgeon without special training, practically as well as by a specialist. It is therefore to be recommended to the general practitioner in cases where some prophylactic operation is urgent.

The points which I wish to make are: (1) that it is better not to do a keratectomy, even if a Mules' operation is done; (2) that when, in doing a Mules', the cornea is sacrificed, whether from choice or necessity, the line of sutures should be protected by sliding the conjunctiva down and attaching it firmly to sclera 3/16th of an inch below the sutures; (3) that when a Mules' is not done, the best evisceration stump is obtained by flattening the sclera, as indicated above.

CLINICAL MEMORANDA.

THE DEVELOPMENT OF MYOPIA.

BY

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Assuming that a patient is slightly myopic, *e.g.*, that he has a myopia of 1 D., and that he is a boy who has to submit to the modern demands of education, necessitating continuous close work, I propose to show that these are the conditions which would naturally favour the development of a higher degree of myopia.

It is a matter of common knowledge that myopic patients lean over their books, and their attitude is regarded merely as a bad habit, which, in children, at any rate, should be amenable to treatment with suitable disciplinary measures. It is also a matter of common experience, that such measures usually fail to achieve the result. They are not successful, because it is not a habit merely which has to be dealt with, but an attitude which is the result of the following process.

It is obvious that a patient with, *e.g.*, 1 D. of myopia does not need to exert his accommodation when looking at a point situated at a distance of 1 metre. He will, however, use 1 metre angle of convergence. At reading distance (0·3m) he will require 2 D. of accommodation and 3 metre angles of convergence. Thus the effort to converge is greater that the effort to accommodate.

I am myself myopic, and I find, that after reading for a time, the print becomes blurred, but, by bringing the book nearer, the print comes into focus again. And the explanation to my mind is as follows.—The effort required to maintain convergence in excess of accommodation becomes a strain and after a time an extra effort is made. This extra stimulus given to convergence spreads to, or involves, the centre of accommodation, and the eye is placed in focus for a nearer point than the one originally looked at. The result is that the print must be brought nearer. Now all is well again for a time until once more the power of convergence is stimulated to greater effort, which in its turn again brings about accommodation for a nearer point. In this way a vicious circle is established, the print is brought nearer and nearer, or what comes to the same thing, the head is bent down lower and lower. This goes on until the strain upon the internal recti becomes too great and the patient looks up to obtain relief, or he gives up convergence and reads with one eye, the other eye deviating outwards. Constant repetition may lead to a permanent strabismus, or the internal recti may become so powerful as to produce an esophoria.

How could an emmetropic patient become myopic? If a patient with emmetropia had some degrees of exophoria, it is conceivable that the effort to overcome it might lead to myopia on the lines indicated above. If that were the common mode of origin, we should expect myopia to be accompanied by exophoria in a large proportion of the cases. And that is so. Exophoria is commonly associated with myopia, whereas esophoria is more frequent in hypermetropia.

I have no desire to find in the above the explanation of the origin and development of every case of myopia; indeed, it would be impossible to do so. But, based as it is, on ascertained fact, it may reasonably apply to a great many cases, perhaps the majority.

It also explains why prisms, given to correct an exophoria or a manifest divergence, will arrest the course of a progressive myopia, when the closest attention to the correction of the refractive error has had no effect in arresting its progress. And it explains, why prisms alone, without any correction of the refractive error, can prevent an increase in the myopia.

It suggests that the immediate correction of an exophoria in emmetropia or low hypermetropia might prevent the onset of myopia and might place an efficient means in our hands to reduce the percentage of myopia in our schools, all hygienic measures having signally failed.

ON THE QUESTION OF FIXATION FORCEPS, WITH OBSERVATIONS ON AMBIDEXTERITY.

BY

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Of forceps for fixing the eyeball, chiefly in operations, there are so many kinds and constructions in use that a comparative consideration of them appears not unnecessary.

The points in question are as follows.—(1) Form, straight or curved. (2) With or without lock. (3) Kind of lock. (4) Kind of grip-end.

The question of what construction is the most practical, being closely allied to that of what kind of operative *technique* is to be followed—especially in cases of cataract—we desire herein to offer a few prefatory observations.

It is admitted that the Graefe flap section can be performed either standing opposite the patient or behind his head. If one will or can make this incision with the right hand only, one has no choice but to operate on the right eye from behind and on the left eye from the front.

Now, it is generally asserted that, in order not to be compelled to this, one must possess a certain innate ambidexterity, and if one does not, one must renounce at the very outset the idea of operating with the left hand. Many are so convinced of this that they do not test the theory at all for themselves, but accept as an axiom that the right hand—which is privileged in nearly all performances—must also, *eo ipso*, be proper to this. It is not so, however. It must not be forgotten that it is here the question of movements which must first be learnt by constant practice, also with the right hand. And for such movements one cannot allow the natural preference for the right hand to be considered. This is best demonstrated by the example of musical instruments. At the piano the left hand can and must learn the same *technique* as the right, and although the left hand is often blamed in difficulties of *technique*, this seems to me to be due rather to lack of uniform practice with both hands, not all teachers of the pianoforte being always so conscientious as to develop their pupils equally with both hands from the beginning and not to yield to superficiality, who, owing to the relative simplicity of the part of the left hand in the easier pieces, prefer to neglect the development of the latter. If, there be anyone to whom this is not not sufficiently clear, let him think of the *technique* of the string instruments. Therein each hand is exercised on a peculiar *technique*, and the left indeed on one much more difficult. Even the cleverest violinist, if he should take the instrument in the right hand and the bow in the left, would be but little better than a beginner. But that such an exercise also is possible, is proved by artists who specially learn this art.

In movements of such complication and fineness, therefore, a natural predisposition to the right hand cannot be taken into consideration.

I affirm, from personal experience, that in our own particular sphere, conditions are no different. From the beginning, the Graefe flap incision —as well as the use of the keratome in suitable cases—has never presented to me any considerably greater difficulties when performed with the left hand than with the right, although for the rest I cannot consider myself ambidextrous. In this most operators competent with both hands will agree with me from their own personal experiences.

Moreover, when one is accustomed, as we are, to use the capsule-forceps always with the left hand, its use with the right hand appears almost more difficult. The same thing would probably be observed with the iris-forceps if it were taken in the right hand.

This being so, the position of the operator behind the patient's head must be regarded as unpractical; above all, because then the operator cannot possibly have the eye before him in such manner as if he were standing opposite the patient. Even in straight gazing of the patient, it would only be had completely *en face* by leaning strongly over the patient's head; in downward gazing, which is indeed absolutely necessary, that is quite impossible; the eye must then always be looked at at a more or less distorted angle, and no one will assert that that is to any advantage. Secondly, at the commencement and often during an operation, the patient must be invited to gaze downwards and to keep to this direction. This requires a somewhat high degree of self-control on the part of the patient; but it succeeds much better if the direction of the gaze be towards the place of the speaker; thus, also, as every operator is aware, one has difficulties with unruly patients; it may be an impossibility with a nervous patient if spoken to over his head. Notwithstanding all this, however, there are ambidextrous operators who make a principle of that which, in presumptive unsuitability of the left hand, may be regarded as a makeshift, operating from behind with both hands.

If we now accept the point of view that both-handed operating from the front is the more practical procedure, the great advantages of the curved fixation-forceps follow therefrom. For the other methods the straight forceps may be the more practical, the holding of the hand then not being such that the advantages of the curved forceps can thereby be brought out; held from the front, the curved one is certainly the more advantageous. By resting upon the cheek, its hold is *light* yet *safe*; while with the straight forceps, in light holds the grip is uncertain, and in firm ones injurious pressure may be exercised. This is admitted by all those operators who discard the fixation-forceps after making the incision, which in our view is in most cases unpractical. Certainly it is not permissible during and after finishing the knife or keratome incision to use either pressure or strong pull with fixation forceps in order to avoid dislocation of the lens and escape of the vitreous; and in this respect the delivery of the straight forceps to the assistant is very dangerous as well as the holding by him during the iridectomy, eventually also during the expulsion if that be performed with two spoons—the Daviel and the Graefe. Therefore in employing the straight forceps, after finishing the incision it is generally dispensed with, and for this reason many operators prefer a forceps without a lock. The great advantage afforded by light fixation during the entire duration of the operation is, however, lost thereby. The latter is rendered possible in the most perfect manner by the curved fixation-forceps, which, resting on the cheek, can be held either strongly or lightly, as required. Consequently the issue is decided by the reflection that shape and weight are so chosen that, on the one hand, the forceps also without holding, that is to say, hanging loose, but lying on the cheek, can do no harm by restless behaviour of the patient, especially by upward gazing, after the completion of the lobe incision; and also not then if, as actually is the case, the holding hand yields to the movements of the eye. On the other hand, its weight may be almost sufficient to give the eye a certain safety in slightly checking the gaze direction.

In the No. 1 Eye Hospital at Budapest for a long time a fixation-forceps has been in use, the original form of which came from Adolf Weber, of

Darmstadt, and which was repeatedly modified by the late Professor W. Schulek, sometime director of our Hospital. The description of a modification by Schulek is contained in the *Ungarische Beiträge zur Augenheilkunde*, Vol. I, p. 213 (Deuticke, 1895). The alteration consists in the replacement of the catch spring-lock used by Weber, by a push-catch; another in the bending of the grip-end to an angle of about 110 degrees instead of an arched curve. The angle-bend was soon discarded and again replaced by a full quadrant bend; the push-catch, however, was retained. Thus arose the model shown in Fig. 1, which somewhat resembles the Noyes forceps, referred to in many text-books of eye operations, but differing from the latter by the push-lock as well as by its size. This model was exclusively used at our Hospital until a few years ago. Although we had no reason to be especially dissatisfied with it, nevertheless it seems to me the form was capable of further improvement, in that neither the bending into a complete quadrant nor the rectangular end can be regarded as practical. The seizing line must, of course, be placed tangentially as much as possible to the surface of the eyeball. But with this form that is possible only with the forceps at the lower edge of the limbus, by an upward-turned gaze. By a downward gaze the tangential grip passes over into a radial. Thus, if the forceps is fixed with an upward-turned gaze, so with the downward gaze, the conjunctiva by the lower end of the grip-surface is strongly pulled from the eyeball, while, on the other hand, the upper angle can be pressed into the sclera, according to circumstances, as the forceps is held; or else the forceps grips with the upper angle only, which is not enough. To remedy this evil, I gave to the forceps shown in Fig. 2, firstly, the curvature of 125° instead of 90°, and, secondly, the grip-end is not rectangular, but was cut off to about 105°. By this another tooth was gained besides, so that at present the forceps has five (rather blunt) teeth instead of the original four, the line of which in downward-turned gaze now stands approximatively tangential, and moreover only a blunt angle comes in contact with the surface of the eyeball. The length of the grip is 85 mm. to the top of the curvature; the short shank is 10 mm. long; and the weight of the forceps is about 10 grammes.

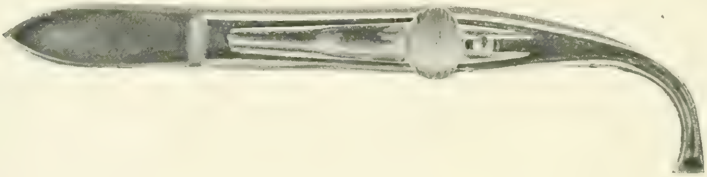

FIG. 1.

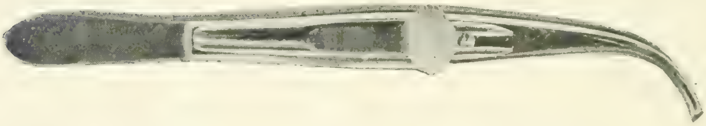

FIG. 2.

We have used the instrument in this form for upwards of two years, and are satisfied with it in all respects. I have now endeavoured to ascertain the specification of the original forceps of A. Weber, but I could find a picture of it nowhere, nor any complete description. A. Weber himself, too, in his otherwise exact and complete essay on his method of linear extraction,* gives no detailed description of the instrument, but merely observes that the forceps is used at his linear extraction, not only for fixation but also for the exercise of pressure, and that therefore a conveniently large grip-surface must be preserved.

I therefore applied by letter to Dr. Weber for precise particulars of his forceps, which request he very kindly complied with. From the sketch supplied by him I perceive that the above-described form represents a very similar reconstruction of the original model, with the exception of the push-lock. Without having seen Weber's model, to have lighted on the same form is to me the best proof of the correctness of this construction. I would like, however, the push-lock to be retained as before. If a catch-spring lock opens very easily, it is too unsafe; if it be difficult, more pressure is required to open it than is the case with an easy-going push-lock, and an unexpected jolting opening may cause injury. For withdrawing the push, too, hardly more time is necessary than for opening the catch-spring, if the latter be opened with care.

We have hitherto placed the lock always on the right side; but if it is desired always to place it on the thumb side, it can be placed on the left side for the right hand and on the right side for the left hand.†

I would like to take this opportunity to recommend the Weber fixation forceps, which has most undeservedly fallen into oblivion.

REGARDING A CASE IN WHICH SOLITARY, WEDGE-SHAPED CHOROIDO-RETINAL ATROPHY WAS OBSERVED IN ASSOCIATION WITH AN ACUTE IRIDO-CYCLITIS. ? POSTERIOR CILIARY INFARCTION.

BY

ERNEST THOMSON, M.D.,

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THE perusal of the interesting article by George Coats in THE OPHTHALMOSCOPE for December, 1913, upon two cases of posterior ciliary infarction associated with chronic irido-cyclitis and increased tension, impels me to record the notes of a case which interested and puzzled me some seventeen years ago. I am more especially inclined to do so because the patient in question has comparatively recently been under observation, and has demonstrated *in propria persona* that there is no likelihood whatever of her eye coming under pathological observation. In other words, the fundus appearances in her case differ from those reported by Coats in being associated with an acute and curable form of irido-cyclitis and not with a chronic form. Indeed, the resemblance between the cases may prove to be no more than superficial: none the less my case was, and is, interesting to speculate upon. The facts follow:

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* v. Graefe's *Archiv f. Ophthalmologie*, Vol. XIII, p. 187 (1867).

† The described fixation forceps is the same as referred to by Professor E. de Grósz, in his paper, "The method of Senile Cataract Extraction practised in the Royal Hungarian University Eye Hospital No. 1," read at the Oxford Ophthalmological Congress, 1913 (see THE OPHTHALMOSCOPE, October, 1913).

Case.

A married lady, then aged 33 years, consulted me first on April 30th, 1897. She had no family, nor has she since that time borne any children. She was somewhat anæmic, and of a pessimistic temperament. There were some glandular scars in the cervical region, but she was otherwise perfectly healthy, and has not between that time and now developed any serious illness. Her medical attendant, Dr. Balfour Marshall, of Glasgow, was quite unable to suggest any possible constitutional cause for the attack about to be described, nor, even in view of our greater present knowledge of tuberculosis as a cause of eye diseases does it seem very reasonable to attribute the attack to that malady, more especially since the patient has during nearly seventeen years remained in good health.* Syphilis may, I think, be regarded as out of the region of the probable.

On April 30th, 1897, I saw Mrs. F. at her own house and in her bed, to which Dr. Marshall had wisely sent her. She gave the history that two weeks previously, she had travelled to London by night and had been exposed to draughts. There had been no traumatism. Almost immediately after arrival in London, the right eye had become painful and had remained so until she saw Dr. Marshall on her return home.

Examination showed irido-cyclitis with a D-shaped pupil from the use of atropine ordered by Dr. Marshall. The aqueous was hazy and the iris discoloured. The vitreous was badly blocked with opacities. Vision was "poor," as my notes say, but since the patient was examined in bed, there may be some excuse for the lack of precision. There is no note as to the tension nor as to the presence or absence of corneal precipitates.

The patient was kept in bed upon milk diet and was treated at first with sodium salicylate and afterwards with grey powder and potassium iodide. The mercurial treatment was given upon general principles and not because syphilis was suspected. Atropine was used to the affected eye for a long time. The anterior portion of the inflammatory disturbance cleared up quickly enough and by June of the same year (1897) all external signs of inflammation had disappeared. Vision remained low owing to the persistence of a vitreous opacity sufficiently dense to prevent the fundus details being made out at all.

Between this time and January, 1898, the patient consulted an ophthalmic surgeon in London, and I rather think a physician also. The oculist wrote to me, and although his letter has gone astray, I remember that he regarded the case as essentially one of iritis. That he also had not been able to see anything in the fundus was evident. By his orders Mrs. F. used inunction of 10 per cent. oleate of mercury to the temple.

When I next saw the patient in January, 1898, the vision had come up to 4/6 and Jaeger I. with correction. For the first time, a view of the fundus was possible. There was a large area of choroido-retinal atrophy extending from

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*Note.—Since the foregoing was written my attention has been called by the Editor to the apparent similarity between this case and those reported by himself (*Transactions Ophthalmological Society U.K.*, Vols. XXVIII and XXX) and by Koller (The Ophthalmoscope, 1910). Tuberculosis seems to be undoubted in Stephenson's case and certainly probable in Koller's three cases. It is one of the points made by Koller that the condition tends to recur, and in this respect certainly my case differs from any of his. Not only has there been no recurrence since healing took place some time in 1899, but there was no evidence at that time in either fundus of any previous attack, however slight. As to a family history of tubercle, neither Dr. Marshall nor I have any notes, but my memory is distinct that we sought anxiously for a possible constitutional cause, and, although tubercle is not specifically mentioned, it is stated in my notes that no constitutional cause was ascertained. Unfortunately it is out of the question, for obvious reasons, to reopen the case now with the patient or her friends.

about 2 P.D. from the nasal margin of the disc as far forward as could at that time be seen, although at a later date its anterior margin could be defined towards the equator. This area was perfectly wedge-shaped with its blunt apex towards the disc. Speaking from memory, assisted by a rough sketch made at a subsequent date, the apex would be about 1 P.D. and the base about 2 to 3 P.D. in vertical diameter. The choroid had been practically destroyed, for my note says: "The choroid is atrophied and the retinal and choroidal pigment scattered over the whitish ground of the patch."

After this there were one or two trifling relapses, the vision going down owing to increase of the vitreous opacity. Various changes were made in the internal treatment. Eventually the eye completely quieted down. In 1900, three years after the onset, the wedge-shaped area and also one or two satellite spots between its apex and the disc were pigment bordered. There was enormous pigment massing along the line of the base of the wedge. Central vision was now 4/4, but there was a scotoma in the field corresponding to the wedge.

In April, 1912, after an absence of twelve years, Mrs. F. returned for correction of her presbyopic error at the age of 48. The areas of atrophy were "solidly pigmented round," and the vision was 4/3—on a different test type, it must be said, and under somewhat different conditions of lighting.

Remarks.

Here, then, is a case of wedge-shaped atrophy of the choroid—there are no notes as to the retina itself beyond what is involved in the pigment alterations—associated with a sudden attack of irido-cyclitis, so far as is known without any rise of tension, and certainly without any permanent rise. It is impossible to say whether the choroidal disease antedated the irido-cyclitis—there are no positive data, although the fact is of value that there had been no symptoms previous to the attack which followed the journey to London—and equally impossible to know what exactly was going on in the posterior ocular tunics for the nine months during which the vitreous was blocked by opacity.

If the wedge-shaped, sharply limited (except for one or two small satellites), isolated, and unilateral area of choroido-retinal atrophy were not due to sudden vascular obstruction, what was it due to? If it *was* due to such sudden obstruction, what brought about the obstruction in a woman of 33 years, apparently healthy except for some degree of anæmia, who had received no traumatism and who has remained in good health otherwise for nearly seventeen years since the occurrence?

TRANSLATIONS.

THE PROGNOSIS OF GLAUCOMA.*

BY

Dr. CHARLES ABADIE,

PARIS, FRANCE.

IN a recent discussion at the Paris Ophthalmological Society on the treatment of glaucoma, M. Chevallereau made the remark that during the last few years the prognosis of glaucoma seems to be becoming more gloomy. On the other hand, we are forced to recognise, by the numerous discussions which take place daily on this subject, that a wretched glaucoma patient must be very perplexed as to his fate. If, as usual, he consults several surgeons, it is more than likely that he will get different advice from each. *Tot capita, tot sensus.* Some surgeons, unduly fearful of those complications which undoubtedly may follow, although fortunately rarely, all surgical interventions in the malignant forms of the disease, restrict themselves to the use of myotics and advise against any operation. Others, faithful to a method which has been well tried, extol the virtues of iridectomy. Those who, rightly or wrongly, are convinced that glaucoma is due to the retention of intra-ocular fluids will speak of sclerectomy, of trephining, of the operation a *l'emporte pièce*, and so on. Under such circumstances it is evident that the prognosis of glaucoma depends rather on the particular surgeon who treats it, on the more or less personal view which he seeks to apply to the case, than on the disease itself, which becomes almost a secondary affair (*passe presque au second plan*).

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* Translation of an article entitled "Pronostic du Glaucome" in *La Clinique Ophtalmologique*, 10 septembre, 1913.

Great enthusiasm followed the grand discovery of v. Graefe, because at that time, without any theoretical ideas or preconceived notions, iridectomy was always systematically performed, simply and solely because it had been observed to have a curative effect. No one cared much why iridectomy had this curative action. Graefe died without solving the riddle, and left to his successors the task of doing so.

Nevertheless, as iridectomy was more and more employed in every form of glaucoma, it came to be recognised that it was not a sovereign remedy, and that there were cases in which it is dangerous and others in which it is useless. It was then that de Wecker, always an investigator and always eager for therapeutic progress, thought out sclerotomy for rebellious cases.

Sclerotomy, thanks to the reputation of its sponsor, had for some time a great vogue. But facts are irresistible ; failures occurred and discredit followed. Then came the discovery of the anti-glaucomatous action of myotics. This was a great discovery too, but like even the most beautiful of medals, it had its reverse side. Myotics, as a matter of fact, are a valuable aid. They act best in simple chronic glaucoma, precisely the type against which one has least power, and in which iridectomy does not exert a favourable action.

But instead of being content to use myotics in this type of glaucoma alone, some timorous surgeons have used this form of treatment in types of glaucoma where it does not succeed, and where it suffers from the grave inconvenience of being substituted for iridectomy, which does succeed.

Dr. Lakah and I have, on several occasions, presented at the meetings of the Ophthalmological Society of Paris patients who were afflicted with a glaucoma which was neither acute nor subacute, but who nevertheless had a manifestly raised tension and a pupil which remained dilated in spite of the use of myotics. Well, many of these patients had been treated in Paris hospitals and consequently by competent and reputable oculists. They had been treated with myotics only. Then when, in spite of the myotics, one eye had been lost and the other had commenced to go, these patients came to consult us, because, rightly enough, they had lost confidence in this form of treatment. Double iridectomy carried out by us was absolutely efficacious in bringing the tension to normal. Of course, the eye which had lost its visual power remained in that condition, but the other eye was saved. These numerous cases, which unfortunately we still see too often, prove, without any doubt, that if iridectomy had been done sooner, both eyes would have been saved, and that if it had been done much later, both would have been lost. Now, is it not accurate to say that in these patients the prognosis of their complaint depends above all on the method of treatment ?

It is my opinion, then, except in chronic simple glaucoma, to which I shall make reference presently, that it is right now, as in the past, to do an iridectomy. What is the use of systematically substituting an operation which is every whit as dangerous as iridectomy in malignant forms of the disease and much more difficult of performance? Even if iridectomy fails, there will always be time to add to it sclerectomy or trephining, which will be done under more favourable conditions, since the operator will not be inconvenienced by the presence of the iris. The introduction of so many operative procedures, inspired mainly by the theories of those who invent them, makes me a little uneasy. Such a rapid substitution of the one for the other of these various surgical measures proves that neither this one nor that one is quite satisfactory in all cases. I am afraid that the condition of those who are afflicted with glaucoma will suffer from so many changes and uncertainties.

In chronic simple glaucoma, but in that only, where we are certain that iridectomy will fail, the trial of new operations is justifiable. But in these cases, too, we must always act with circumspection and prudence. It is precisely in these cases that the judicious and prolonged use of myotics has in the past given results which, while not perfect, are very satisfactory. We must not risk a loss of vision by operation.

Our unfortunate colleague, Javal (whose history has often been very inaccurately stated) was afflicted with chronic simple glaucoma, and for thirteen years, thanks to myotics, his vision was maintained between 1/3 and 2/3. He had the unhappy notion of being operated upon, not merely by one but by several surgeons, and the result was disastrous. It is possible that he would have maintained his modicum of sight until the time of his death if he had had the wisdom to refrain from being operated upon.

Then, as a contrast to this unfortunate man, we have the case of Professor Laqueur. He suffered from this form of glaucoma, which came on without the slighest inflammatory symptoms and was characterised only by a slight elevation of tension, by the appearance of coloured circles round light, &c.; the very form which at the present time one persists in attacking by trephining. Professor Laqueur merely had an iridectomy performed on each eye in succession by Professor Horner, of Zürich. After this double operation he was able to continue for ten years (until his death) his duties as professor at the eye clinique without anybody ever being aware of the operations which he had undergone. *Et nunc erudimini.* ERNEST THOMSON.

A NEW OPERATION FOR THE REDUCTION OF CICATRICIAL STAPHYLOMA OF THE CORNEA.*

BY

DR. G. ATTIAS,

NAPLES, ITALY.

FEW conditions of the eye have led to so many suggestions in the way of their surgical treatment as cicatricial staphyloma of the cornea, says Attias, and in spite of all, their scanty success is shown by the fact that in the majority of cases, the surgeon advises his patient to submit to complete removal of the eye.

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* Abridged from *Archivio di Ottalmologia*, 1913, Vol. XXI.

Many methods have been suggested for the reduction of curvature, but these apparently have not appealed to operators with success. The consideration of the mechanical problem has led Attias to see that the removal of a fragment in the shape of a star with three or four points from a strongly curved lamella, allows it to assume a lesser curvature, and he has attempted in the operation under mention to utilize this principle.

The first part of his communication is devoted to a review of the methods of past operators to save some part of the eye to the patient. A large number of surgeons have always refused to adopt them on account of the risk of sympathetic ophthalmia, thinking that the preservation of a part of an eye, which still remained unsightly, was so small a gain that it did not make the risk a justifiable one.

After this review, Attias proceeds to give the details of his own procedure as follows :

"The eye is anæsthetised with some local anæsthetic, and the speculum is fixed. Then, a Graefe's knife is passed from a puncture on the outer side of the base of the staphyloma across the eye to make a counter-puncture on the nasal side of the staphyloma ; the edge should be directed straight forwards. With sawing movements, the surgeon then makes a cut forwards through the opaque cornea. We have then a horizontal incision joining the points of puncture and counter-puncture (Fig. I). While this incision is being made, the aqueous escapes ; the escape should be gradual. The lens is then removed, when necessary, by means of a spoon, and a good piece of the iris is excised.

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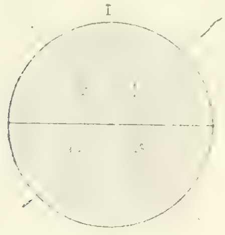

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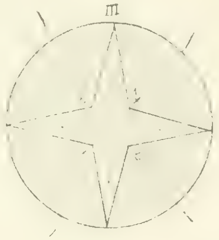

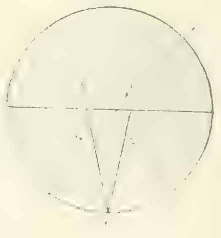

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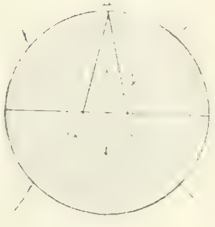

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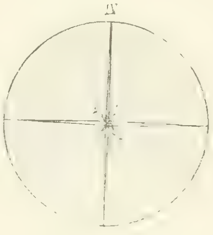
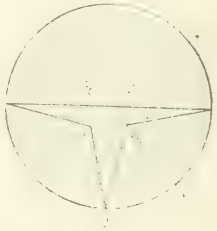




The sutures are now to be passed : the first needle, armed with the finest silk, perforates the cornea in the infero-external quadrant at a point 3 mm. from the limbus, and comes out again through the cornea at a corresponding point in the supero-internal quadrant. (1^1 and 1 in Fig. I). The second needle takes a similar course, crossing from the upper-outer to the lower-inner quadrant. (2^1 and 2 in Fig. II) Then with de Wecker's scissors, introducing one blade through the first incision, the surgeon cuts out small triangular flaps as shown in Figs. II and III. A little care is needed during this step, to avoid cutting the sutures ; the scissors should lie entirely in front of the silk threads. If by accident one thread should be cut, it is not difficult to pass another armed needle through the original punctures. After the incision of the flaps, a star-shaped space is left in the cornea, which is closed on tying the sutures (Fig. IV).

The speculum is then removed, the conjunctival sac is washed out, and a little iodoform, or xeroform, is powdered over the parts, and both eyes are bandaged. On the third day the sutures are to be removed.

If the wound is delayed in healing, or if the cut margins of the corneal tissue are infiltrated, the application of pure carbolic acid gives excellent results.

It must be borne in mind that the amount of corneal tissue to be excised will vary according to the case, and the surgeon must study each case carefully beforehand, so as to estimate the exact extent of the flaps.

This operation is applicable to partial staphylomata as well as to complete. In operating on a partial staphyloma, the surgeon deals with the base of the partial as if it were a complete staphyloma, but carries the incisions a little beyond the limit of the opacity into clear cornea, so that the resulting curvature may be as regular as possible. Where the staphyloma lies near the margin, occupying, for example, the lower half of the cornea, one may remove a star with three points instead of four, as shown in Figs 1 and 2.

The surgeon must decide whether to add any measures against glaucoma, according to the nature of each case.

Attias concludes by thanking Professor A. Angelucci for his help in making trial of this procedure. HAROLD GRIMSDALE.

CURRENT LITERATURE.

NOTE.—Communications of which the titles only are given either contain nothing new or else do not lend themselves to abstract.

I.—PATHOLOGY.

(*First Notice.*)

(1) **Contino.—The examination of the tears of syphilitics, presenting ocular manifestations, to show the presence or absence of specific anti-bodies. (Ricerca degli anticorpi specifici nelle lacrime dei sifilitici con manifestazioni oculari.)** *La Clinica Oculistica*, Giugno, 1911.

(2) **Ruata.—Trachoma and gonorrhœa: researches on the presence of specific amboceptors in the blood of trachomatous patients and their relation to the blood of individuals immunised against the gonococcus. (Ricerche sulla presenza di ambocettori specifici nel sangue di tracomatosi e loro rapporto col sangue di individui immunizzati contro il gonococco.)** *Rivista Italiana di Ottalmologia*, Gennario, 1912.

(3) **Tschirkowsky, W.—The transmission of antibodies in the fluid of the anterior chamber of the 'operated' eye. (Zur Frage des Uebergangs der Antikörper in die Flüssigkeit der vorderen Kammer des operierten Auges.)** *Klin. Monatsbl. f. Augenheilk.*, Februar, 1912.

(4) Koyanagi, Y.—Experimental investigations of the retinal changes set up by injection of blood into the vitreous. (Experimentelle Untersuchungen über die Netshautveränderung durch Blutinjektion in den Glaskörper.) *Klin. Monatsbl. f. Augenheilkunde*, Dezember. 1912.

(5) Stölting, B.—On internal rupture of the sclera with remarks on ring abscess. (Ueber die innere Skleralruptur nebst Bemerkungen über den Ringabszess.) *Klin. Monatsbl. f. Augenheilkunde*, Januar, 1913.

(6) Koyanagi, A.—The pathological anatomy of the retina after extirpation of a tumour of the optic nerve. (Zur pathologischen Anatomie der Netzhaut nach der Exstirpation eines Sehnerventumors.) *Klin. Monatsbl. f. Augenheilkunde*, Mai, 1913.

(7) Rosenhauch, Edmund.—Two cases of ocular actinomycosis. (Zwei Fälle von Aktinomykose des Sehorgans.) *Klin. Monatsbl. f. Augenheilkunde*, Juni, 1913.

(8) Tertsch, R.—Vitreous vessels in a case of panophthalmitis. (Glaskörperfässe in einem Falle von Panophthalmitis.) *Zeitschrift für Augenheilkunde*, Juli, 1913.

(9) Hess, C.—About a till now unknown cause of severe purulent choroido-retinitis with retinal detachment. (Ueber eine bisher nicht bekannte Ursache schwerer eiteriger Chorio-Retinitis mit Netzhautablösung.) *Archiv. f. Augenh.*, Juli, 1913.

(1) The result of a number of examinations shows that the tears of these patients give constantly a negative reaction, although the serum gives a positive. Therefore we can conclude without doubt, that the lacrymal gland does not allow the passage of the amboceptor antibody of syphilis, even when the eye shows active manifestations of the parasite.

HAROLD GRIMSDALE.

(2) The subject of this paper is sufficiently shown from the title, which indicates also the lines on which the author has tried to solve the vexed question of the supposed relation of gonorrhœa to trachoma. The points which he set out to examine are two: whether the disease, trachoma, produces in the blood of infected persons any differentiable specific antibodies, and whether any relation between the diseases of gonorrhœa and trachoma can be traced from examination of the blood.

The mere fact that trachoma is a local disease, is not enough to exclude the presence of antibodies in the general circulation. Other local diseases, *e.g.*, jequirity ophthalmia, are able to produce specific antibodies. And, further, the very chronic course of trachoma makes it not unlikely that in time the products of local immunity might gain access and be found in the general circulation.

Ruata has examined sixty-two cases of trachoma, and has found in all that the result is always negative for the presence of specific amboceptors; that the antigen of trachoma prepared by him never provokes deviation of the complement, but gives place to a complete hæmolysis, exactly as in the normal control serums.

He concludes that the pathogenic agent of trachoma, whatever it may be, has no affinity or relation with the pathogenic agent of blennorrhœa, since his trachomatous antigen has shown itself completely inactive towards the specific amboceptors existing in the serum of patients immunised against the gonococcus.

HAROLD GRIMSDALE.

(3) Miyaschita and others have ascertained that, in the immunised animal, agglutinins, hæmolysins, bacteriolysins, and other antibodies pass over into the aqueous. **Tschirkowsky**, of Kasan, points out that these results have an important bearing on the question of infection of different parts of the eye. He has conducted a series of experiments with the object of ascertaining whether the conditions prevailing in an eye after operation have any influence on this transmission of antibodies. His present communication deals with the results of removal of the lens from the eye of the rabbit. Assuming that the irritation of the operation itself causes an increased transmission of the substances in question, he postponed his investigations until all traces of irritation had subsided. In his first series the immunisation was carried out before the operation, and the antibodies of the aqueous were estimated about three weeks after the operation. In his second series immunisation was not carried out until three or four months after the operation, and the estimations took place some two months later. Tschirkowsky found invariably that the antibodies were transmitted more abundantly to the aqueous of the eye from which the lens has been removed, and this was more pronounced in the first than in the second series of experiments. These statements refer to hæmolysins, but strictly similar results were obtained in the passage of bacteriolysins (cholera) and agglutinins (B. typhi). A. J. BALLANTYNE.

(4) **Koyanagi**, of Kioto, sets out to answer the questions: Have retinal and vitreous hæmorrhages any ætiological connection with retinitis proliferans? and, Is the new-formed tissue derived from connective tissue or from glia? He experimented on the eyes of rabbits, first tapping the anterior chamber and then injecting 0.3 to 0.5 c.cm. of their own blood. His conclusions are as follows.—The injection of blood into the vitreous did not cause any inflammation in the uvea. In the retina two kinds of change were observed:—first, and most commonly, a growth of glia tissue from the bases of Müller's fibres spreading over the anterior surface of the retina; and, secondly, primary degenerative changes in the retina. In some cases a mass of new-formed tissue was found growing from the disc into the vitreous and the mass of injected blood. This is connective tissue, and seemed to play an important part in the absorption of the blood. It also led to detachment of the retina. Assuming that these results would have been obtained also in the human eye, the author thinks that retinal and vitreous hæmorrhages play a part in the causation of retinitis proliferans. He concludes also that the new-formed tissue in retinitis proliferans is for the most part glia tissue, although, where there are recurrent vitreous hæmorrhages, we must assume also the existence of connective tissue growth. A. J. BALLANTYNE.

(5) **Stölting**, of Hanover, publishes the following case.—The patient was a girl of fourteen years. The affected eye was said to have been larger than the other from a few days after birth. Repeated attacks of inflammation brought it to the condition seen at the first examination, namely, general enlargement of the eyeball, a blue-black pericorneal zone, opacity of the cornea, and the iris apparently close against the back of the cornea. Microscopic examination of the enucleated eye showed great thinning of the sclera. At one side there was a staphyloma at the line of junction of the sclera and cornea, produced by a hiatus in the layers of the sclera separating the canal of Schlemm from the anterior chamber. This staphyloma and the whole of the posterior surface of the cornea was lined with the greatly thinned iris. There was a funnel-shaped detachment of the retina and choroid, the disc was deeply cupped, and there were cicatrical changes in the anterior zone of the choroid.

Discussing the pathogenesis of the condition, the author comes to the conclusion that the primary affection was an anterior choroiditis. The products of this inflammation would block the filtration channels, leading to rise of intraocular pressure, and at the same time would reduce the mechanical resistance of the tissues concerned. This combination of conditions would lead to the rupture of the inner layers of the sclera in the region indicated. He thinks the mechanism of the rupture is the same as that accepted for the ruptures of Descemet's membrane which occur in hydrophthalmos. He invokes the same mechanism to explain blood-staining of the cornea and abscess of the cornea. In the first case blood, and in the second case the cellular exudation resulting from infection in the anterior chamber, are unable to escape through the normal filtration channels, and find their way through the ligamentum pectinatum into the posterior layers of the corneal substance.

A. J. BALLANTYNE.

(6) In the case reported by **Kiyanagi,** of Kyoto, the eye was enucleated a month after removal of a tumour of the optic nerve, injury of the posterior ciliary vessels being unavoidable when the tumour was removed. The changes found on microscopic examinàtion were as follows: In the equatorial region above and below, the retina showed intense atrophy of all the nervous elements and a high degree of pigmentation. The choroid in the same areas showed moderate sclerosis and reduction of vascularity, and the chorio-capillaris had disappeared. The rest of the retina was atrophic in its inner layers. There was marked proliferation of the pigment epithelium in the retina and optic nerve.

A. J. BALLANTYNE.

(7) The first case reported by **Rosenhauch**, of Cracow, was in a woman 28 years of age, who complained of a feeling as of something under the upper lid. There was moderate hyperæmia of the bulbar conjunctiva, and some yellowish granules were seen in the upper tarsal conjunctiva near the fornix. These were found to consist of spores and mycelium, and cultural tests established that they belonged to actinomyces albus. The condition seemed to have arisen from something entering the eye while she was engaged in field work.

The second case was in a child of 11 years who developed a corneal ulcer after injury by a twig. Spores and mycelium were found in the material covering the ulcer, and these were proved, by culture, to belong to actinomyces albus acidus.

These cases are respectively the second of actinomycosis of the conjunctiva and the sixth of actinomycosis of the cornea published at this date.

A. J. BALLANTYNE.

(8) **Tertsch**, working in Professor Fuchs' clinic at Vienna, reports a case of panophthalmitis in which vessels were found in the vitreous which sprang from the retinal vessels. The author inclines to the view, that they were new-formed vessels, the result of the panophthalmitis, but he also suggests that they might be a congenital abnormality. He found a somewhat similar, although less well-marked, condition in a specimen in Fuchs' collection.

T. HARRISON BUTLER.

(9) **Hess**, of Munich, describes the case of a child, four years old, whom he saw on December 21st, 1912. The right eye was normal, while the left had ciliary injection with the entire corneal epithelium opaque, iris discoloured, fundus details not to be made out. Tension not increased. The child was again brought to him on the 26th of January, 1913, when the cornea and the iris were as before. The tension was increased, and there was a green-yellow reflex from the pupil. There were fine deposits on Descemet's membrane. Complete amaurosis. Enucleation.

After equatorial division, the posterior half showed the following picture.—The retina was entirely detached and, on section, found to be much thickened. The vitreous was highly opaque and degenerated. Behind the retina in a dried mass was found a half transparent formation which by closer examination was found to be a fly larva. The anterior part of the eye showed relatively slight changes. On microscopical examination, it was found there had been a severe purulent inflammation of the detached retina and choroid. The larva was of the cattle fly, *Hypoderma Bovis.*

There are on record three cases of larvæ in the anterior chamber. A five years' old patient of Stalberg suffered with irritation and photophobia in one eye, followed later by pain and vomiting. A larva of the *Hypoderma Bovis* was found in the anterior chamber. Krautners and Ewetzky each reported similar cases, and in none of them was it found out how the larvæ had entered the anterior chamber. Until now it had not been known that fly larvæ could settle themselves in the posterior section of the eye. This case shows that such an accident can call out a severe inflammation of the retina and choroid. The history of the case gave no clue as to how the larva had entered the eye. Hess supposes the entrance was through the blood stream, as the larvæ of the *Hypoderma Bovis* wander long through the body before taking up their position under the skin.

HANFORD McKEE.

II.—CONCRETIONS IN THE LACRYMAL CANALICULI.

(1) **Wissmann, R.—Fungus concretions in the canaliculi; also a contribution to the question of the streptothrix. (Ueber Pilzkonkremente im Tränenkanälchen, zugleich ein Beitrag zur Frage der Streptotricheen.)** *Klin. Monatsbl. f. Augenheilkunde*, März, 1913.

(2) **Lange, O.—Fungus concretions in the canaliculi. (Pilzkonkremente in den Tränenröhrchen.)** *Klin. Monatsbl. f. Augenheilkunde*, Juni, 1913.

(3) **Löwenstein, Arnold.—Fungus concretions in the canaliculus. (Zur Frage der Pilzkonkremente im Tränenröhrchen.)** *Klin. Monatsbl. f. Augenheilkunde*, Juli, 1913.

(1) **Wissmann**, of Breslau, bases his paper on a case in which a concretion was accidentally discovered. Attention was drawn by widening of the upper punctum, thickening in the region of the upper canaliculus, redness of the neighbouring lid margin, conjunctiva, and caruncle, and escape of pus from the punctum. On slitting the canaliculus, a yellow concretion was found. The eye, which was suffering from a traumatic ulcer of the cornea, had been fomented with some herbal preparation, which the author thinks might be the source of the infection. Sections of the wall of the affected canaliculus showed that the fungus had no tendency to penetrate into the tissues, but the latter showed a chronic hypertrophic inflammation. The staining and cultural characteristics of the growth are described at great length, after which the author, referring to the discussions which have taken place as to whether such concretions should be described as streptothrix or actinomyces, considers the relationship of these to one another and to other vegetable parasites. He analyses the facts regarding a large number of cases published as actinomyces, streptothrix, and leptothrix, and concludes that, while one cannot deny the occurrence of a true actinomycosis in the canaliculus, in the great majority of instances the organism was a streptothrix, as in his own case, and that the organism in question has characteristics which distinguish it from actinomyces and even from streptothrix occurring in other situations.

A. J. BALLANTYNE.

(2) **Lange**, of Brunswick, objects to the statement made by Wissmann, in the March number of the *Monatsblätter* (see above), that there is no justification for the diagnosis of actinomycosis of the canaliculi, and that all such conditions should be described as streptothrix. He refers to a case reported by himself in 1897, which, for reasons given, he still holds to be actinomycosis. In a foot-note it is stated that Uhthoff has since seen Lange's specimens, and agrees that actinomycosis is the correct diagnosis.

A. J. BALLANTYNE.

(3) **Löwenstein**, of Prague, calls attention to the omission from Wissmann's article in the March number of the *Monatsblätter* (see above) of reference to two cases published by Elschnig under the title of actinomycosis, and the views of Elschnig and Löwenstein thereon. Regarding treatment, he protests against the advice to slit the canaliculus, thinking it sufficient to express the contents and to cleanse the canaliculus with solution of oxycyanide of mercury.

A. J. BALLANTYNE.

III.—THE WASSERMANN REACTION IN OPHTHALMOLOGY.

Liégard and Offret.—The Wassermann reaction in interstitial keratitis, irido-choroiditis, oculo-motor paralysis, and optic atrophy. (Le réaction de Wassermann dans les kératitis interstitielles, les irido-choroidites, les paralysies oculomotrices et les atrophies optiques.) *Annales d'Oculistique*, décembre, 1912.

Liégard and **Offret**, of Paris, working in the laboratory of the Quinze-Vingts have tested 167 patients by the Hecht-Levaditi or Hecht-Bauer-Weinberg modifications of the Wassermann reactions. In their earlier experiments they checked the Hecht-Levaditi method by the classical Wassermann, and they have come to the conclusion that the three methods gave identical results. As is usual in such investigations, the patients were divided into classes according to the clinical probability of their suffering from syphilis and the following table summarises the results obtained :

Name of disease.	Probable hereditary syphilis.		Acquired syphilis.				Doubtful syphilis.	
			certain.		probable.			
	+	−	+	−	+	−	+	−
Interstitial Keratitis	23	4	1	0	5	0	12	6
Iritis	0	0	4	2	4	1	7	33
Choroiditis	0	1	1	0	0	0	1	9
Optic Atrophy	0	0	2	0	2	0	3	6
Ocular Paralyses	0	0	1	1	2	0	6	6
Various affections	0	0	2	0	1	4	3	14

The authors conclude.—(1) A positive Wassermann affords strong presumption of the presence of syphilis. (2) The value of a negative reaction is very restricted. (3) The high percentage of positive reaction in interstitial keratitis, especially in cases in which there is no evidence of hereditary syphilis, strongly supports Hutchinson's theory. (4) In spite of the restricted value of a negative reaction, the contrast between the results obtained when there was no clinical evidence of syphilis in interstitial keratitis (66 per cent. W.+), and in irido-choroiditis (only 16 per cent. W.+), is an argument in favour of those who attribute a secondary *rôle* to the spirochæte in the causation of the latter disease. (5) The results in nervous cases (55 per cent. W.+, and only one W.— in confirmed tabes) agree with what is clinically known of the considerable *rôle* of syphilis in these affections. In cases in which the Argyll Robertson pupil was absent, the proportion of positive results fell to 20 per cent.

R. J. COULTER.

IV.—FOREIGN BODIES AND THEIR REMOVAL FROM THE EYE.

(1) **Weill, N. J.—The extraction of steel spicules, needles, pins, tacks, etc., with the Haab giant electro-magnet.** *American Journal of Ophthalmology*, May, 1912.

(2) **Rollet.—On the extraction of intra-ocular magnetic foreign bodies with the giant electro-magnet. (De l'extraction des éclats magnétiques intra-oculaires à l'électro-aimant géant.)** *Archives d'Ophtalmologie*, juin, 1912.

(3) **Arcelin.—The value of radiography in the investigation of intra-ocular foreign bodies. (Valeur de la Radiographie par la recherche des corps étrangers intra-oculaires.)** *Revue Générale d'Ophtalmologie*, 30 juin, 1912.

(4) **von Hippel, Eugen.—Extraction of particles of copper from the vitreous. (Ueber Extraktion von Kupfersplittern aus dem Glaskörperraum.)** *Klin. Monatsbl. f. Augenheilkunde*, Juli, 1912.

(5) **Lamb, F. W.—The rational method of removing fragments of iron from the interior of the eye.** *Ophthalmology*, July, 1912.

(6) **Haase, Gustav.—Extraction of a copper splinter from the vitreous. (Extraktion eines Kupfersplitters aus dem Glaskörper.)** *Klin. Monatsbl. f. Augenheilkunde*, September, 1912.

(7) **Nance, Willis O.—The giant magnet in the extraction of foreign bodies from the eye.** *Journal of Ophthalmology and Oto-Laryngology*, October, 1912.

(8) **Wood, Casey A.—The removal of a piece of steel from the apex of the orbit.** *Ophthalmology*, October, 1912.

(9) **Rogers, W. K.—Observations concerning foreign bodies within the eye or orbit.** *Ophthalmology*, January, 1913.

(10) Ammann, E.—How to deal with a chip of steel in the lens. (Zur Frage der Behandlung der Eisensplitter in der Linse.) *Klin. Monatsbl. f. Augenheilkunde*, Februar, 1913.

(11) Handech, M.—On the detection and the localization of heavy foreign bodies in the eye by means of the Röntgen rays. *Zeitschrift für Augenheilkunde*, März und April, 1913.

(12) van der Hoeve, J.—Extraction of copper particles from the vitreous. (Extraktion von Kupfersplittern aus dem Glaskörperraum.) *Klin. Monatsbl. f. Augenheilkunde*, Mai, 1913.

(13) Elschnig, A.—Iron particles in the lens. (Eisensplitter in der Linse.) *Klin. Monatsbl. f. Augenheilkunde*, Juni, 1913.

(14) Dalmer, Max.—On the failure of magnet extractions when the sideroscope examination is positive. (Ueber das Versagen der Magnetextraction bei positivem Sideroskopbefund.) *Zeitschrift für Augenheilkunde*, Juni, 1913.

(15) Genet.—Magnetic shot-grains in the orbit: extraction by the magnet. (Plombs de chasse magnétiques de l'orbite, extraction à l'aimant.) *Revue Générale d'Ophtalmologie*, 31 août, 1913.

(16) Ryerson, G. Sterling.—On foreign bodies within the eyeball. *Canada Lancet*, December, 1913.

(1) **Weill**, of Pittsburgh, Pa., who for two and a half years was assistant to Haab, is a firm believer, after years of experience, in the method of extraction of magnetisable foreign bodies from the eye, and frequently from other parts of the body, by means of the giant, stationary, horizontal magnet. Practically in every detail he follows the Haab rules, and since these have been expounded quite recently in these columns by the present reviewer (*see* "Notes from some Continental Eye Clinics" in THE OPHTHALMOSCOPE for May, 1912), it seems unnecessary to abstract Weill's interesting article on the same lines. ERNEST THOMSON.

(2) This article, by **Rollet**, of Lyons, is a continuation of his experiences with the use of his giant electro-magnet (*see* THE OPHTHALMOSCOPE, Vol. IX, No. 8).

Details are given of eighteen cases in which the fragment was successfully extracted. In two of these the fragment was situated in the anterior portion of the globe, and in both vision was preserved; in one case up to 2/3, notwithstanding an attack of iritis. In the remaining sixteen the fragment lay in the posterior portion of the globe, including the ciliary body. The results were:—two enucleations, nine eyes saved without vision, three of which showed operable traumatic cataract, and five eyes possessing a visual acuity of from 1 to 1/8. In no case was there sympathetic inflammation.

Rollet is convinced that the proper course is to use the magnet in all cases and at once, and that the magnet cannot be too powerful. His instrument, it may be recalled, exercises with 23 ampères and 110 volts a carrying force of 400 kilogrammes and exceeds that of any other by from 70 to 150 kilogrammes. To modify the attraction power exerted, he prefers the rheostat to other methods, such as varying the distance between the magnet and the eye, or using a long point. Although it is very difficult (according to some authors, impossible) to extract a fragment weighing ·5 of a milligramme or less, attempts should be made, and will be successful provided the magnet be very powerful.

As regards *technique*, it is best to have the patient lying down, and the magnet placed vertically. In operating on the eye at the same time, it is necessary to use non-magnetic instruments. These have been obtained by making the speculum of German silver, and the remainder of nickel steel which contains 25 per cent. of nickel ; and in the case of knives a sufficient cutting edge has been obtained by "hammer-hardening" the blades in the cold. It is thus possible to operate in the full magnetic field. Displacement of the iris is the accident to avoid. To avoid slight tearing of the membrane, it is necessary to proceed with caution by interrupting the current, and as soon as the iris is slightly displaced by the fragment tending to come through it, to perform iridotomy or a small iridectomy.

The prognosis must, the author says, evidently be guarded, but "extraction with a powerful magnet, conducted methodically and step by step, may prevent enucleation, and maintain or restore normal, or at least useful, vision."

BERNARD CRIDLAND.

(3) This short article by **Arcelin**, of Lyons, is concerned with the attitude which the prudent radiographer ought to take up in making a report.—To begin with, it is a mistake to deny the presence of a metallic foreign body because the radiographer can find no indication on the plate. It is absolutely rash to offer explanations of such failure, such, for example, as oxidation of the foreign body. The report should merely state that radiography fails to indicate the presence of such body. When the result is positive, the approximate region of the eye in which the foreign body is situated can be ascertained by the method of Crossmann, namely, by taking photographs when the patient looks upwards, downwards, and straight forwards, and by an antero-posterior exposure. The calculation of the real size of the particle is a very difficult matter, and although a good approximation can be come to by making a number of exposures at different angles, it is a delicate and time-consuming process. It is better, then, to be on the safe side, and be content to state that the shadow is of such and such a size, since an obliquely lying, long-shaped piece of metal may throw a shadow at a given exposure incidence which would indicate a size altogether different from that indicated by an exposure in some other direction. Further, in practice, elaborate research on the exact size of the particle is quite wasted.

ERNEST THOMSON.

(4) The great majority of eyes in which a piece of copper is embedded come ultimately to enucleation. The statistics given by Leber in 1904 showed that in 18 out of 40 eyes removal of the foreign body was attempted. It was successfully removed in 18. In 15 the eye was permanently saved, but in only eight of these was any useful degree of vision retained. In the present paper **von Hippel**, of Halle, gives an analysis of 58 cases operated upon and reported in the literature (Leber's group of cases included). In 41 the metal was extracted, in 9 the eye subsequently had to be enucleated. The eye was thus saved in 32, but vision was retained in only 19. Of course, cases vary very much in their suitability for successful removal of the foreign body. In some it can be seen with the naked eye, in others by the ophthalmoscope, while in others the situation of the particle may only be indicated by that of the exudate surrounding it, or it may be quite out of sight, or concealed by lental or vitreous opacities.

The author contributes fifteen new cases which have come under his personal notice. Removal of the foreign body was attempted in ten. In seven the eye was preserved. In five of these vision amounted to from 1/25 to 5/7. In the other two, there was perception of light with good projection and a prospect of better vision later.

He believes that in these cases the particles are mostly aseptic, the eyes stand the interference well, and settle down quickly after the foreign body has been removed. If cataract is present, he gets rid of it as soon as possible, so as to allow of early localisation and removal of the foreign body, since the prognosis is better the earlier removal is possible. If the eye is quiet and localisation is impossible, one is justified in waiting some time, as it sometimes becomes possible to localise the object at a later date. A. J. BALLANTYNE.

(5) **Lamb**, of Cincinnati, disapproves of Haab's method of removing foreign bodies from the eye by the large stationary magnet, because the practice of bringing the patient to the magnet is unnatural and awkward, the forcible traction of the metallic body towards the front of the eye may lead to injury to the lens or displacement of the lens from injury to the suspensory ligament, and the foreign body may become entangled in the ciliary processes.

In dealing with a magnetic particle, he advises that the small magnet be employed. If pain, movement of the iris, or other sign points to the presence of such a body, and if the wound of entrance is large and situated in the sclera, the point of the magnet may be inserted and the body extracted directly. If, on the other hand, the wound is small, or if it is in the cornea, a meridional scleral incision should be made about six millimetres in length and commencing ten millimetres behind the limbus, under a conjunctival flap. The magnet point can then be passed into, or, if necessary, through the vitreous to reach the foreign body. If the first application of the magnet did not give any indication of the presence of a metallic foreign body, a radiogram should be made, and, if this were positive, extraction should be attempted through a subconjunctival scleral incision. The *rationale* of this procedure is that the part of the sclera in question is suitable for operative interference, because it is behind the ciliary body and in front of the orá serrata ; it is not concerned in vision ; it does not contain any important vessel or nerve ; and, finally, it heals well.

A. J. BALLANTYNE.

(6) **Haase,** of Harburg on the Elbe, records a very successful result in a case of operation for the removal of a piece of copper from the vitreous chamber. The object could be seen by focal illumination through the cornea. Illuminating in this way by means of a forehead lamp, he introduced a pair of forceps through a meridional scleral incision. The end-result was excellent. The eye became quiet, the iris retained a greenish colour, the pupillary reactions were good, and the tension was normal. There was a small stationary lens opacity and a slight retinal detachment in the lower part of the fundus, but vision amounted to 5/7 without glasses. A. J. BALLANTYNE.

(7) **Nance,** of Chicago, first pays a tribute to Haab, of Zürich, whose name will be always associated with the giant magnet. The smaller or hand magnets were used previously with more or less success. With the giant magnet it is not necessary to introduce the tip into the eyeball, a very decided advantage.

The extremely serious import of penetrating ocular wounds is emphasised. The beauty and delicacy of structure is easily and irremediably damaged, and the vitreous offers unique conditions for infection. The second eye is apt to suffer from "sympathetic disease." It is safe to say that a large proportion of cases of sympathetic uveitis occurs in eyes in which a foreign body is retained in the injured eye.

Most of the perforating injuries to the eye are those produced by flying pieces of steel, and Nance's contribution is naturally concerned with these. If the foreign body be in the anterior chamber, and can be readily seen, the method of removal is greatly simplified. The hand magnet can be employed, and the chip of iron removed through the original wound of entrance, or a new wound made at the corneal limbus. When the metal lodges in the vitreous, the giant magnet finds its place, and the *technique* of removal requires the greatest skill and ingenuity. Harm has already been done, and as little more as possible must be effected in the act of removal.

The Roentgen rays give most important information as to the size and the location. Early treatment is most important. HENRY L. G. LEASK.

(8) In the case described by **C. A. Wood,** of Chicago, a piece of steel flew up and struck the outer border of the orbit, and was then supposed to have fallen to the ground. The eye remained red but free from pain. Six weeks after the accident, there was pain, and discomfort on rotation of the eyeball. Diplopia developed, and watering of the fellow eye set in. Ten months after the injury, vision in the injured eye was reduced to finger-counting, the field of vision was much reduced, there was vitreous hæmorrhage, optic neuritis, and localised detachment of the retina. There was no foreign body in the eye, but radiograms showed the presence of the piece of steel at the apex of the orbit. At the operation, it was found imbedded in the bone at the upper border of the spheno-maxillary fissure. It was removed, and along with it the eyeball. A. J. BALLANTYNE.

(9) **Rogers**, of Columbus, Ohio, contributes an instructive paper based on his experience of 116 cases in which the problem of dealing with a foreign body had to be considered. In 93 the foreign body was in the eye, in 23 in the orbit. Wood, glass, stone, copper, lead, iron, and steel were the substances found. The paper contains many details which cannot be abstracted, but these are some points of interest.—Ninety-three magnet operations were performed, and in each case an attempt at *X*-ray localisation was made. He discusses the relative value of the giant magnet and magnets of the portable type, sometimes replaced by a flexible shaft extension from the giant magnet. His conclusion is, "If I could have but one magnet at my disposal, it would be of the portable type; but I would be as reluctant to be deprived of a giant magnet for suitable cases as I would to depend on it for all cases."

The prognosis was found to be best when the foreign body was in the anterior part of the globe, and, speaking of those situated behind the lens, he emphatically expresses the opinion "that a metallic foreign body back of the lens must be removed, or the eye enucleated, for the safety of its fellow, instances of long toleration to the contrary notwithstanding." Infection he found surprisingly rare. He warns us against accepting without reserve statistics of favourable primary results in cases from which foreign bodies have been removed. Eleven cases with a good primary result returned with secondary degenerative changes, and, as he has seen similar cases from other clinics, he supposes that other cases which did not return suffered in the same way.

A. J. BALLANTYNE.

(10) A patient came to **Ammann**, of Winterthur, for advice five days after getting a chip of steel in his right eye. There was a very small wound in the lower part of the cornea, a slight tear of the margin of the iris, an opacity about 1·5 mm. in diameter in the anterior surface of the lens, and a faint opaque line passing through the lens to the metal chip, which was visible. Elsewhere, the lens was clear. Vision, corrected, was 0·6. The author decided to leave it alone. For three months, the condition remained stationary. A month later, there was some failure of vision. There was opacity in the immediate neighbourhood of the steel, and a star-shaped posterior cortical cataract was developing. To prevent further loss of vision, he then attempted extraction of the chip by Haab's magnet. At a first sitting he made a small opening in the anterior capsule of the lens and

brought the chip into the anterior chamber, extracting it at a later stage. Six months later, vision was somewhat worse, owing to increased opacity of the lens. He is convinced that the opacification of the lens, which remained in abeyance for three months, was not primarily due to the trauma but to a chemical reaction on the part of the foreign body. He believes now that he would have obtained a better result by removal in the first instance, although cases have been reported in which steel has remained in the lens for years without causing any disturbance. A. J. BALLANTYNE.

(11) **Handech**, an assistant in Holzknecht's *X*-ray Laboratory, attached to the Vienna General Hospital, tells us that when there is a metal fragment in the eye or the orbit a correctly taken skiagram will always reveal its presence. If there be clinical grounds for suspecting the presence of such a foreign body, and the photograph fails to show it, a second exposure should be made. Particles of stone and of lead glass are generally shown upon the plate. Failure is caused by errors in exposure and development. A double plate should always be used, since otherwise flaws in the plate may be mistaken for the shadows of a foreign body.

The method used for localization does not appear to be as scientifically accurate as those of Mackenzie Davidson and Sweet. The latter method is favourably discussed, but, as is too commonly the case in German papers, the British method is not even mentioned. In Vienna, five exposures are made with the eye fixing five different objects, and the position of the object is judged by consideration of the manner in which the shadow moves, one of the prominent shadows of bone being used as a reference. If the shadow be sufficiently evident, the movement is examined upon the fluorescent screen.

T. HARRISON BUTLER.

(12) **van der Hoeve,** of Utrecht, criticises the article of von Hippel which appeared in the July number of *Monatsblätter* (*see* abstract above). The situation of the exudate is not a trusworthy guide to the situation of the foreign body since there may be several foci of exudate; in his experience, the foreign body is often situated near the wound of entrance, and the field of vision is also [illegible] unreliable guide, since detachment of the retina may take place at some point distant from the foreign body. In the opinion of van der Hoeve, the *X*-rays are a much better means of arriving at the situation of the particles, and they should always be used as early as possible, in order to get exact localisation of the foreign bodies. The author recommends for localisation purposes the appliance known as " Wessly's shell."

A. J. BALLANTYNE.

(13) **Elschnig**, of Prague, gives details of the case of a medical student who presented a small wound of the cornea, a corresponding wound in the anterior capsule of the lens, some opacity of the lens, and a small chip of steel visible in the posterior capsule. Application of the magnet 24 hours after the injury was successful in removing the foreign body. The corneal and capsular wounds healed and the lens opacity cleared up. More than a year later, the lens was still clear and vision perfect.

Using this case as his text Elschnig reiterates the view expressed by him in 1910, that in such cases, if the wound is still open, the metal must be at once removed by the magnet, and if the wound has healed, a small incision should be made in the lens capsule to permit of its removal. Discussing the published cases, he expresses the opinion that there is nothing in the literature to support the idea that a chip of iron may remain indefinitely in the lens without causing opacity. This can only happen if the foreign body is adherent to the anterior capsule and embedded in proliferated capsular epithelium.

A. J. BALLANTYNE.

(14) **Max Dalmer,** of Giessen, discusses those cases in which the giant magnet fails to extract foreign bodies in the eye, although they have caused a deflection of the sideroscope. The first cause of failure is that the foreign body has traversed the globe and lies outside it in the orbit. The second cause is a rare one: the splinter is imbedded in the wall of the globe or in the ciliary body. It may be imbedded in exudate or organized blood-clot. The third reason is that the magnetizable property of the object is very small in proportion to its size. Some varieties of steel and of iron ore are only very slightly capable of being magnetized, and yet are capable of giving a sideroscopic reaction. Nickel and cobalt are non-magnetic, but affect the needle, as do bismuth, tin, zinc, lead, and copper, although only very slightly. None of these metals is attracted by the magnet. The presence of nickel in steel greatly reduces its magnetic capacity. Other alloys of iron, for example, those with titanium, chromium, vanadium, molybdenum, and tantalum, and with other elements, show greatly reduced magnetic power, some, indeed, none at all. Some varieties of high speed tool steel are only slightly magnetic. T. HARRISON BUTLER.

(15) If the reviewer is not mistaken, it has been pointed out before from the *clinique* of Professor Rollet, of Lyons, that sporting shot in France, at any rate, may be formed of iron, not of lead. In this article **Genet,** of Lyons, describes a case in Rollet's *clinique* in which a number of shot grains had been embedded in the orbit for many years, giving rise to abscess formation from time to time. The eye had been enucleated at the time of the original gun-shot injury. It was found by experimental application of the magnet that some at least of the shot were of iron, not of lead, and localisation by X-rays was carried out. Cert[illegible] of these pellets only were deemed to be causing trouble and an attempt was made under chloroform to get them out. One was so extracted but the other was so hemmed in by cicatricial tissue—possibly also it was non-magnetic—that it could not be extracted. ERNEST THOMSON.

(16) **Ryerson,** of Toronto, lays it down as an axiom [illegible] a foreign body embedded in the eyeball leads, sooner or later, to loss of [illegible] globe, provided the foreign body be not removed with the electro-magnet (or by other means). Of the eyes from which foreign bodies are taken away with the magnet, about 50 per cent. are saved, but of those a considerable number undergo subsequent degeneration.

Ryerson sums up his remarks as follows :—

1. In every case of a foreign body within the eye an effort should be made at the earliest possible moment to remove it by means of the electro-magnet.

2. When this fails the eye should be removed. If suppuration has not begun, by evisceration. If it has begun, by excision and implantation of a Mules' ball.

3. Sooner or later a foreign body will cause destruction of the injured eye, and, if unremoved, sympathetic ophthalmia.

4. In every doubtful case an X-ray picture should be taken of the eye by an expert, who will be able not only to demonstrate the presence of a foreign body, but to locate its position within the eye. SYDNEY STEPHENSON.

V.—"HOLES" (TRAUMATIC) IN THE MACULA.

(1) **Purtscher, Adolf.—Traumatic hole-formation at the fovea. (Traumatische Lochbildung in der Fovea.)** *Klin. Monatsbl. f. Augenheilkunde*, Januar, 1913.

(2) **Alt, Adolf.—Remarks on holes in the macula lutea and fovea centralis, with the report of a new case.** *American Journal of Ophthalmology*, April, 1913.

(1) **Purtscher**, of Vienna, makes an interesting contribution to the subject of the origin of macular "holes." It is now generally known that, although such holes are often observed after contusion of the globe, they may also develop spontaneously under other conditions; and pathologists are agreed that there is primarily an œdema of the macular region, which is followed by destruction and absorption of the tissue elements at the macula. Purtscher quotes three cases, of which the first two present no feature of unusual interest. The third, when seen thirteen hours after the injury, presented "Berlin's œdema" in the region of the macula and between it and the disc. This partly concealed a dark spot one quarter of a P.D. at the fovea. The field of vision was peripherally contracted, but there was no central scotoma. Five days later, the œdema had disappeared, the dark spot was larger, finely granular, and surrounded by a pale zone. The field of vision expanded to normal limits, but a central scotoma developed. The visual acuity was permanently reduced. The manner in which the central scotoma developed supports the view that the "hole" was not present immediately after the injury, and as a direct result of it, but made its appearance later, as a consequence of molecular changes leading to resorption. A. J. BALLANTYNE.

(2) **Alt**, of St. Louis, discusses the ætiology of macular "holes" in general. His views differ in some respects from those of some other writers. The new case which he reports is that of a youth whose left eye was injured by the explosion of a percussion cap, fragments of the cap remaining in the eye and necessitating enucleation. Examination of the swollen macula region showed that the œdema had evidently produced a minute hole in the tissues which later on (*i.e.*, if the eye had not had to be removed) might have led to a plainly visible hole formation. It seems from this specimen, Alt says, that it represents a very early stage of the formation of a hole in the fovea, and that a high degree of hyperæmia of the choroid may, with the aid of some mechanical or chemical influences, lead to a localised œdema in the macula lutea and its nearest surroundings, which, if it persists long enough, may lead to a rupture of the inner layers and the inner limiting membrane, and thus may cause the formation of a hole. Those interested specially in this subject should read Alt's description of the changes found. ERNEST THOMSON.

VI.—OPERATIONS.

1.—Trephining.

(1) **Barraquer, J. A.—On Elliot's operation. (Sur l'opération d'Elliot.)** *La Clinique Ophtalmologique*, 10 mars, 1913.

(2) **Vogt, Alfred.**—A modified and electrically driven Elliot trephine. (Ein elektromotorisch betriebener und modifizierten Elliotschen Trepan.) *Klin. Monatsbl. f. Augenheilkunde*, April, 1913, and *Bericht der Ophth. Gesellschaft*, Heidelberg, 1913, p. 412.

(3) **Isakowitz, J.**—Late infection after Elliot's trephining. (Ein Fall von Spätinfektion nach Elliottrepanation.) *Klin. Monatsbl. f. Augenheilk.*, Juni, 1913.

(4) **Axenfeld, Th.**—Late infection from trephining operations. (Zur Spätinfektion nach trepanierenden Operationen.) *Klin. Monatsbl. f. Augenheilk.*, Juni, 1913.

(5) **Rochon-Duvigneaud and Ducamp.**—Experimental researches upon the cicatrisation of corneo-scleral trephinings. (Recherches expérimentales sur la cicatrisation des trépanations cornéo-sclérales.) *Bull. de la Société d'Ophtal. de Paris*, juin, 1913.

(6) **Kuhnt, H.**—Late infection after Elliot's trephining. (Spät-Infektion nach Elliot-Trepanation.) *Zeitschr. für Augenheilkunde*, August-September, 1913.

(1) The article by **Barraquer**, of Barcelona, has for its main object the insistance on the necessity of dissecting the conjunctiva very far forwards in the performance of sclero-corneal trephining. Four figures are given in the text, illustrating the effects of trephines of 2 mm. and of 1·5 mm. respectively, according to the position in which they are placed. It may be mentioned that Barraquer is in favour of a preliminary inferior bridge sclerotomy before the performance of the trephine operation. ERNEST THOMSON.

(2) The disadvantages of the Elliot trephine, according to **Vogt,** of Aarau, are.—(1) Its use involves pressure on the globe, there is indentation of the corneo-sclera at the point of application, and consequently there is danger of injury to the lens, etc., at the moment of perforation ; (2) The manipulation of the instrument causes changes in the position of the eyeball, and makes in difficult to ensure uniformity in the direction of the application ; (3) The stop rotates with the trephine and may get entangled with the conjunctival flap, and, moreover, it obscures the incision.

Vogt's modified trephine is actuated by a motor like that used for a dental drill. The stop does not rotate with the trephine blade, and it only partly surrounds the trephine. The motor permits of rotations of from 100 to 2,000 per second. The advantages claimed are that the instrument necessitates the minimum of pressure on the globe, allows precise application of the trephine with rapid and clean cutting, does not obscure the field of operation, and, finally, does not involve any danger of injury to the conjunctival flap or of loss of the disc in the anterior chamber. A. J. BALLANTYNE.

(3) **Isakowitz,** of Berlin-Halensee, reports the case of a man, 63 years of age, on whom Elliot's trephining operation was performed for simple glaucoma. von Hippel's trephine was used. The operation was successful, and a favourable result followed. Six weeks later, he complained of pain, the conjunctiva over the trephine hole was red and swollen, the aqueous turbid, and there was hypopyon, as well as exudate in the pupil. Some improvement occurred under appropriate treatment, but the ultimate fate of the eye was still in doubt at the time of writing.

The author has no doubt that the path of infection was the operation wound, and that the condition is analogous with the late infection which sometimes follows the formation of a cystoid cicatrix after cataract extraction or iridectomy.

Isakowitz is apparently unaware that the von Hippel trephine has been employed by Elliot, Nimmo Walker, and others, since he remarks that, in view of the complaints made on all sides regarding the hand-worked trephine, it is a wonder that no one, except Fröhlich, has thought of using von Hippel's instrument.

A. J. BALLANTYNE.

(4) The patient whose case is reported by **Axenfeld**, of Freiburg i. Br., was a man, 45 years of age. Nine months after the performance of a successful Lagrange operation (irido-sclerectomy), he complained that he was more shortsighted, and the eye became red and painful. The conjunctival cushion, hitherto translucent, became opaque from greyish-yellow infiltration. Fluorescein demonstrated the presence of a minute fistula on the summit of the cushion which allowed escape of aqueous. There was no evidence of any intraocular involvement, but the danger seemed imminent. Scopolamin, protargol, and warm applications were employed, but two days later, the fistula closed spontaneously, iritis with hypopyon developed, the cushion flattened into a cicatrix closing the scleral opening, and a chronic inflammatory type of glaucoma set in. It has been possible to improve this to some extent by means of miotics.

Axenfeld discusses the possibility that the thickness of the conjunctival or episcleral flap may play a part in the risk of late infection.

A. J. BALLANTYNE.

(5) **Rochon-Duvigneaud** and **Ducamp**, of Paris, recount experiments made upon the eyes of four cats, in order to study the conditions of cicatrisation of trephine holes. An account of these experiments is to be found in THE OPHTHALMOSCOPE of October last, p. 636.

Discussion.

Polack, of Paris, advocated the removal of a scleral disc by means of a suture, passed through the hollow part of a trephine, much as suggested in 1910 by George Young, of New York.

Joseph, of Paris, thought it might be useful to submit the removed scleral disc to microscopic examination.

Morax, of Paris, believes that clinically a cystoid cicatrix allowing one to affirm the existence of subconjunctival fistulisation is obtained in most eyeballs subjected to the operation of trephining. After the eighth day following the operation, it is by no means uncommon to find the tension of the globe a little raised when the parts are examined by the tonometer.

SYDNEY STEPHENSON.

(6) **Kuhnt**, of Bonn, notes that although Elliot's operation is an excellent method of reducing intra-ocular tension, it has its disadvantages. Thus, Wagenmann reports a case of late infection of the eye, and Kuhnt says "certainly many others will follow." He himself has recently had a case which forms the subject of this communication:

A man, aged 44 years, was trephined on the 10th February, 1913, with peripheral iridectomy. The 7 mm. wide conjunctival flap was united with a single suture. General improvement followed the operation. On February 25th, the second eye was similarly treated with peripheral iridectomy and a conjunctival suture. On the 26th, violent sneezing caused severe hæmorrhage into the anterior chamber and under the conjunctival flap, which took a long time to become absorbed. On the 21st of May slight conjunctival catarrh was noted on both sides, and the patient was advised to re-enter the clinic; but, owing to pressure of business, he did not do so. On the 2nd of June he reappeared with great pain in the left eye, the first to be trephined. Vision was reduced to perception of light, there was severe ciliary injection and violent pain. The conjunctiva over the trephine hole was greatly thickened, eroded, and infiltrated. The cornea was steamy, and there was a suppurative iritis with hypopyon. Large numbers of pneumococci were present in the secretion from the conjunctiva. Under treatment, the inflammation gradually subsided, but the filtration was destroyed and the tension rose to from 30 mm. to 32 mm. of Hg. The field contracted, especially nasally. On July 20th, V.=5/24.

T. HARRISON BUTLER.

2.—Enucleation and its Substitutes.

(1) **Sattler, C. H.—On the transplantation of rib-cartilage into the capsule of Tenon after enucleation. (Ueber Rippen Knorpeltransplantation in die Tenonsche Kapsel nach Enucleation.)** *Bericht der Ophthalmologischen Gesellschaft*, Heidelberg, 1912.

(2) **Tschirkowsky, W.—Fat implantation in Tenon's capsule after enucleation. (Ueber Fettimplantation in die Tenonsche Kapsel nach der Enukleation.)** *Klin. Monatsbl. f. Augenheilkunde*, Mai, 1912.

(3) **Bey, Sameh.—A new method of exenteration of the eye in panophthalmitis. (Un nouveau procédé d'exentération de l'œil dans la panophtalmie.)** *La Clinique Ophtalmologique*, 10 mai, 1913.

(4) **Boulai.—Enucleation — evisceration. (Enucléation — eviscération.)** *La Clinique Ophtalmologique*, 10 septembre, 1913.

(1) **Sattler**, of Giessen, describes a method in which he implants shavings of cartilage from the sternocostal articulation into the capsule of Tenon, and so secures a good movable stump to carry the artificial eye. The shavings tend to curl up into scrolls, which can be manipulated to fit the capsule; the conjunctiva is sutured over them, and the interstices eventually become filled with connective tissue. This method is better than the implantation of fat, which shrinks and becomes necrotic. The various balls of glass or gold all cause irritation, and are mostly extruded in the long run or have to be removed.

T. HARRISON BUTLER.

(2) A material which is to be used for implantation in Tenon's capsule after enucleation must be sterile or easily sterilisable, and must be of such a nature that it will be indefinitely tolerated by the human tissues, and will not be absorbed. Since Mules introduced the use of glass balls, numerous substitutes have been tried, including rubber, glass-wool, asbestos, silver, aluminium, ivory, celluloid, elder pith, paraffin, bone, and the eyes of smaller animals. These have all some drawbacks. Most of them act as foreign bodies. **Tschirkowsky**, of Kasan, is of the opinion that fat implantation is the best method yet discovered. Experimental investigation of the fate of the implanted fat is so far very scanty, but seems to point to a certain absorption of the fat, and its replacement by connective tissue of somewhat smaller bulk. The use of fat in a similar way to obliterate the depressed scars sometimes occurring at the orbital margin, has produced most satisfactory, and apparently permanent, results.

Axenfeld's method is as follows.—The necessary amount of fat is excised from the abdominal wall, and while an assistant is stitching this wound, the enucleation is proceeded with. The fat is kept in lukewarm physiological salt solution. In enucleating the eye, each of the tendons is threaded on a purse-string suture, the ends of which are brought out through the bulbar conjunctiva in front of the plica semilunaris. When the eyeball has been removed, and hæmorrhage arrested by tampons, the fat is inserted in Tenon's capsule, the purse-string suture is drawn together and tied with a knot which lies on the exposed surface of the conjunctiva, and the conjunctival wound itself is closed with four to six vertically placed sutures. All the stitches can be removed after a week, and in most cases a prothesis can be worn a few days thereafter.

The clinical details of thirty-five cases are given in a table which accompanies the article. A. J. BALLANTYNE.

(3) **Sameh Bey**, of Cairo, finds fault with the classical operation of exenteration of the eye on the ground that so much of the outer tunic of the eye is removed, that the stump is not as satisfactory as might be for the wearing of the prothesis. Between the years 1899 and 1912, he has performed the modification of the operation here described, 475 times. Essentially the operation consists in retaining the cornea instead of cutting it away along with a small portion of the sclera. Not only is there a better stump, but the operation is more quickly performed. Sameh Bey makes a median keratotomy, separates the two lips of the cornea with forceps, and evacuates the contents of the eye with the curette. The internal surface of the sclera is then well scrubbed with a firmly squeezed cotton pledget soaked in mercury cyanide solution. The cavity is thoroughly washed out with 4 per cent. phenol solution, and a single stitch is placed to hold the corneal lips together. The stitch is removed five days later; in twelve or fifteen days the prothesis may be worn. Sometimes the keratotomy is done at the margin instead of at the centre of the cornea; and in cases where there is a wound of the cornea, the direction of the wound is followed, and the lips trimmed if they are infiltrated.

A statistical table is appended, from which it appears that Sameh Bey has operated after this plan, 68 times for panophthalmitis of endogenous origin, and 407 times when it was ectogenous. The metastatic cases were due 27 times to influenza, 16 times to enteric, 11 times to puerperal fever, and 14 times to infantile diarrhœa. The ectogenous cases occurred in adherent leucoma 161 times, in non-adherent leucoma 103 times, and as the result of trauma, 43 times. These are surely remarkable figures.

ERNEST THOMSON.

(4) **Boulai**, of Rennes, makes an appeal, in typically French fashion, for enucleation and always enucleation in every case in which an eye is lost. None of the substitutes for enucleation is safe. ERNEST THOMSON.

3.—Eyelids.

(1) **Kuhnt.—How can we prevent deformities when compelled to remove the whole thickness of the lid edge? (Wie vermeiden wir Entstellunggen bei umscriebenen Abtragungen der Lidrander in ganzer Dicke.)** *Zeitschrift für Augenheilkunde*, März, 1911.

(2) **Lindenmeyer, O.—Weeks' operation for complete symblepharon. (Die Operation des totalen Symblepharon nach Weeks.)** *Zeitschrift für Augenheilkunde*, März, 1911.

(3) Cramer, E.—A modified application of Kuhnt's operation for blepharitis ectropion. (Ueber anderweitige Verwendung der Kuhntschen Operation des Blepharitisektropiums.) *Zeitschrift für Augenheilkunde*, Mai, 1911.

(4) Maher, W. Odillo.—An operation for epiphora due to eversion of the lower punctum. *Australasian Medical Gazette*, June 20th, 1911.

(5) Wicherkiewicz, B.—On my operation for trichiasis and distichiasis with some critical and historical remarks. (Ueber meine Trichiasis- und Distichiasisoperation nebst einigen kritischen und historischen Bemerkungen.) von Graefe's *Archiv f. Ophthalmologie*, Bd. LXXX, 3 Heft, 3 Januar, 1912.

(6) Fernandez, Santos.—The treatment of trichiasis and distichiasis by raising and pushing forwards the palpebral border, by means of a flap of skin from the temple. (Tratamiento del triquiasis y distiquiasis levantando y adelantando el borde palpebral merced a un colgajo de piel de la sien.) *Arch. de Oftal.*, Noviembre, 1911.

(7) Amat, Marin.—A new operative procedure for entropion of the lower lid. (Un nuevo procedimiento operatorio del entropion el parpado inferior.) *Arch. de Oftalmologia*, Febrero, 1912.

(8) Fromaget, Camille.—Congenital ptosis cured by Motais' operation. (Ptosis congenital guéri par l'opération de Motais.) *L'Ophtalmologie Provinciale*, février, 1912.

(9) Fergus, A. Freeland.—Ptosis operations. *Ophthalmic Review*, February, 1912.

(10) Tamamscheff, C. and Greiz, W.—Plastic restoration of the tarsal portion of the upper lid with employment of a pediculated conjunctival flap. (Ein Versuch der Plastik des tarsalen Teiles des Oberlides mit Benutzung eines gestielten Konjunktivallappens.) *Klin. Monatsbl. f. Augenheilkunde*, März, 1912.

(11) Lotine.—On various methods of blepharoplasty. (Sur divers procédés de blépharoplastie.) *Ann. d'Oculistique*, mai, 1912.

(12) Alt, Adolf.—An unusually large cyst of the lower eyelid: Operation. *American Journal of Ophthalmology*, December, 1912.

(13) Amat, Marin.—A contribution to the study of blepharoplasty. (Contribucion al estudio de las blefaroplastias.) *Arch. de Oftal.*, Febrero, 1913.

(14) Goodenow, N. H.—Wolfe graft used to correct a total ectropion of upper eyelid. *Ophthalmology*, April, 1913.

(15) Bey, Sameh.—The operation for trichiasis and entropion and the conditions for its successful performance. (L'opération du trichiasis, de l'entropion, et les conditions de son succes.) *La Clinique Ophtalmologique*, 10 juin, 1912.

(16) Smith, Priestley.—Discussion on a case of acute purulent keratitis in exophthalmic goitre. *Trans. Ophth. Society U.K.*, Vol. XXXIII, 1913, p. 71.

(17) **MacLennan, Alex.—A few examples of grafting.** *Clinical Journal*, November 19th, 1913.

(1) It is occasionally necessary to remove part of the lid margin in cases where warts and epitheliomata have to be excised. **Kuhnt**, of Bonn, avoids deformity by separating the lid below the defect, into two parts, a tarso-conjunctival and a muscle-skin part. The incisions used to excise the growth are continued into and across the tarsus, and the separated part is drawn towards the lid margin and sewn in place. A special pair of forceps, with horseshoe-shaped ends, facilitates the procedure. The skin defect is easily dealt with. If the tarsus itself has to be removed, a modification of the method is employed, and the defect is covered by sliding a piece of tarsus laterally. It is exceedingly difficult from the scanty diagrams to grasp the exact method used in these cases. Two photographs, however, show the excellent result obtained. T. HARRISON BUTLER.

(2) The operation described by Weeks at the International Congress at Lucerne, 1904, has received scant attention, and is not mentioned in Czermak's "Text-book of Operations."

Lindenmeyer, of Frankfort a. M., has found it so satisfactory that he describes in detail how it may be applied to cases where the globe has been lost. The operation is performed as follows.—The outer canthus is split up to the orbital margin. The lid is separated from the cicatricial orbital tissue, leaving only the fibres of the orbicularis attached to it. The lids must be separated up to the periosteum of the orbital margin. The skin pocket so formed stretches from the inner canthus to the outer margin of the orbit. It is scarcely necessary to excise any cicatricial tissue. When the superior pocket is being fashioned, the levator palpebræ must be divided. The pockets must now be packed with moist strips of gauze while the graft is being prepared. The form and size of this graft is best determined by making a model of guttapercha. This model is laid upon the inner surface of the upper arm and a graft one third larger than this model dissected away. The graft is spread over the thumb and its subcutaneous tissue is cut away. The graft is now folded skin side inwards and two or three double-armed needles passed through the fold with the bight of the sutures in the fold. The graft must be constantly covered with moist warm compresses. This graft is now laid on forehead or cheek (for upper or lower cul-de-sac) and the double-armed needles led through the bottom of the pocket through the periosteum at the edge of the orbit and out through the cheek or brow, to be tied over a pad of gauze. The edge of the graft is now sewn to the lid margin and orbital tissue covering the whole wound. A dental plate made of the substance dentists use to take impressions is moulded into the pocket to keep the graft in good opposition. The most careful asepsis must be maintained. A dressing is applied, and is changed after three to four days unless there is any reason for doing so sooner. The plate is to remain *in situ* ten to fourteen days. Double sutures are to be removed after ten to fourteen days.

If the conjunctiva is completely absent, the upper and lower pockets must be made at separate sittings, about three weeks apart. Three weeks later the artificial eye may be worn. T. HARRISON BUTLER.

(3) **Cramer**, of Cottbus, describes a case in which this operation gave a satisfactory result in a case of severe contraction which followed the long continued use of an artificial eye. T. HARRISON BUTLER.

(4) For the relief of epiphora due to a displaced lower punctum lacrymale, **Maher,** of Sydney, removes about 2 mm. of the posterior lip of the canaliculus, first divided for a distance of about 3 mm. by a Weber's knife.

The procedure he recommends does not materially differ from that usually assigned in England to the late Haynes Walton. SYDNEY STEPHENSON.

(5) After giving a short summary of the history of his operation for trichiasis, which is a modification of the method of Jaesche - Arlt, **Wicherkiewicz,** of Cracau, describes some modifications which he has more recently introduced. The idea of the operation is to lift the ciliary margin of the lid sufficiently and to support it in its altered position by the transplantation of a small non-pedunculated flap of skin. He now proceeds in the following manner.—Instillation of 2 per cent. cocaine and subcutaneous infiltration according to Schleich (novocain 0.02, aq. dest. 9.0, adrenalin 1 per cent. 1.0). Introduction of Jaeger's plate, intermarginal section, and careful removal of stray roots of cilia ; now the lid is replaced and a flap of suitable size cut out at about the level of the convexity of the tarsus. Now the lower portion of the lid which bears the lashes is drawn up and fixed by a few stitches, while the excised skin-flap is carefully cleansed from all adhering tissue and pressed against the exposed defect. The dressing should not be removed for four days. Should the tarsus be much deformed, this operation is combined with the removal of a prismatic portion of the tarsus in the usual way. It sometimes happens that a few lashes in a faulty situation appear some time afterwards. This is due to their having been overlooked during the operation ; the tarsus should then be again exposed and the roots excised or cauterized. In very rare instances the flap fails to take root, when a second operation may become necessary. This operation is less useful in trichiasis of the lower lid, where Wicherkiewicz recommends Holtz's operation or cauterization, according to Galezowsky. R. GRUBER.

(6) In cases of trichiasis without entropion, **Fernandez** has obtained good results by dividing the external canthus, scarifying the conjunctival surface of the upper lid and transplanting on to this raw surface a flap of skin cut from the temple and turned into position through the wound in the canthus. He does not recommend this procedure on cosmetic grounds, but considers it most suitable for labourers who can afford to be careless of appearance, but demand the power of working in comfort. HAROLD GRIMSDALE.

(7) The condition of entropion, when met with in the lower lid, is usually slight and easily dealt with. **Amat**, of Almeria, has met with some severe cases for which he has devised the following operation :

The special points are the division of the tarsal plate and the conjunctiva, and the excision of a cutaneo-muscular flap, followed by reversion of the lash-bearing zone of the lid.

The stages are : (1) a horizontal incision through skin and orbicularis in the whole length of the lid, from the punctum to the external canthus, at a distance of about 3 mm. from the lid margin. Then a second incision is made, curved with the concavity upwards, joining the first at the two ends and separated from it in the middle by a distance proportional to the effect desired. The flap contained between these limits is excised completely. Then (2), the lid is everted and the tarsal plate divided from end to end, from the conjunctival surface. The third stage is the passing of the sutures. These, three or four in number, run from the upper flap, behind the hair follicles, to the lower edge of the skin wound. When they are tied, the lashes are everted.

HAROLD GRIMSDALE.

(8) **Fromaget,** of Bordeaux, relates the history of a case operated on by Motais. The result was excellent. Before the operation the patient was unable to raise the upper lid ; when she looked up the cornea was covered by the lid. He gave a brief account of the anatomy and physiology of the two associated muscles, the rectus superior and levator palpebræ superioris.

Motais' first case was shown to the French Society of Ophthalmology in 1897, in the following year a second case was exhibited before the Society of Ophthalmology of Paris, the Academy of Medicine and the Surgical Society of Paris.

The patient, a girl aged 17, had Dransart's operation performed on the same lid when she was eight years of age. The result was unsatisfactory. Under chloroform anæsthesia, the upper lid was everted and the upper conjunctival fornix exposed by pulling down the eyeball and drawing up the everted lid. The insertion of the superior rectus was then sought for by making an incision in the conjunctiva 15 mm. long with a curved pair of scissors; in the centre of this a second vertical cut was made down to the tarsus, a hook was put under the tendon, and a needle inserted two millimetres from the insertion and one from the internal border of the muscle, it was brought out so as to include a portion of the muscle 3 mm. wide, the thread was tied, and the section of muscle detached and brought out between the tarsus and skin, and stitched there.

P. A. HARRY.

(9) In this paper, **Fergus**, of Glasgow, criticises several of the operations in use for ptosis, and describes one which he has found to furnish good results in most cases, excepting those in which the frontalis is absent or imperfect. It consists in the resection of the tarsus, and the stitching of the border of the resected tarsus to the fibrous continuation of the frontalis. A horizontal incision is made, a few millimetres from the lid margin, through the skin, another begins at one end of this, and curves round to the other end, including the whole of the skin of the eyelid proper. The upper part of the tarsus as an horizontal oblong is next removed, and the cut edge of the tarsus is stitched to the strong fascia coming down from the frontalis by means of catgut, and the edges of the skin are brought together. He claims that the operation allows the patient to open and to close the eyelid.

A. H. PAYAN DAWNAY.

(10) **Tamamscheff** and **Greiz**, of Tiflis, had under their care a young man with a chondro-sarcoma of the upper lid, about 2 cm. in diameter and 1 cm. thick. Removal of the tumour with a margin of healthy tissue left a square gap equal to about two-thirds of the total area of the lid. To fill this the following procedure was adopted.—Above the gap the palpebral conjunctiva was dissected from the subjacent tissues up to the fornix, and a flap a little wider than the gap was isolated by two vertical incisions. This flap was drawn down and stitched in position. Then a patch of skin from the inner side of the upper arm was grafted in front of it, and the skin and the conjunctiva were stitched along the free margin. The lid margins were stitched into contact until the stitches were removed on the seventh day. Some tension on the stitches in the outer line of junction of the graft led to the formation of a small coloboma-like notch in this situation, and consequently to imperfect apposition of the two lid margins. Otherwise the result was satisfactory.

A. J. BALLANTYNE.

(11) **Lotine**, of St. Petersburg, gives descriptions of a series of operations for the repair of cicatricial deformities of the eyelids, with illustrations of the conditions before and after treatment. He agrees with those who hold with Valude that the transplantation of pedunculated flaps is the method of choice, and that recourse should only be had to free flaps when the former method is inapplicable. He is further of opinion that extensive cicatricial changes in the skin, provided they are not too deep, do not constitute a contra-indication to the transplantation of pedunculated flaps, even if they are cut from the cicatricial tissue, and he refers to one of the cases in support of this contention.

R. J. COULTER.

(12) The lid cyst in the case reported by **Alt**, of St. Louis, was of exceptional size. The contents were apparently fluid. Excision would have necessitated a plastic operation. The cyst was incised through the skin surface at its lower margin, and packed with an iodoform tampon. A week later the wound had closed, but there seemed to be a small quantity of fluid in a much smaller cyst. This was incised and the interior swabbed with tincture of iodine. "Ever since, the tumour has gradually shrunken, and now forms a very small solid nodule at the edge of the lid, like a small stye."

ERNEST THOMSON.

(13) **Amat**, of Almeria, publishes the results of a series of operations which he has performed in patients needing the operation of blepharoplasty. He strongly advocates the employment of the method of Fricke, or the modification of Richet or Dieffenbach. He points out that all cases require tarsorraphy, and that the closure of the lids should remain as long as possible.

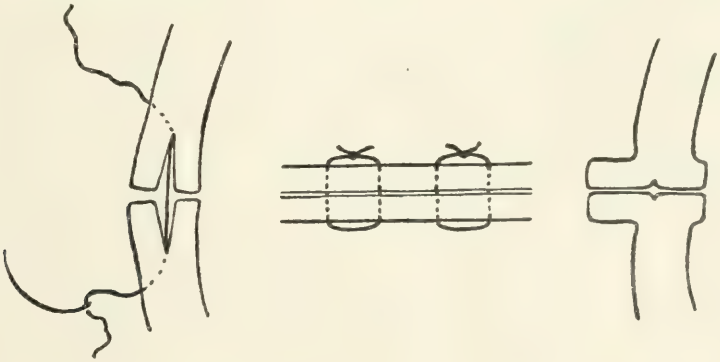
In some instances, where ectropion was threatened, he was able to avert it by prolonged tarsorraphy, and he counsels this procedure whenever practicable. HAROLD GRIMSDALE.

(14) **Goodenow,** of Everett, Washington, lays down the following conditions to ensure success with the Wolfe whole skin graft.—"The surface to be grafted must be freshly and thoroughly denuded, it must be free from granulation tissue, it must be aseptic, it must have a good blood supply, a liberal allowance of skin must be given to allow for shrinkage. In applying a graft to the eyelid, say for ectropion, the exposed area must be extended by considerable over-correction of the position of the lid before applying the graft."

In the case here reported Thiersch grafts had been twice applied to correct a cicatricial ectropion. On both occasions the primary result had been satisfactory, but with ultimate failure from shrinkage. A single Wolfe graft produced a permanently satisfactory result. A. J. BALLANTYNE.

(15) **Sameh Bey**, of Cairo, gives a minute description of the Anagostakis-Panas operation for the relief of trichiasis and entropion. It is unsuitable for abstraction.

(16) **Priestley Smith**, of Birmingham, describes a method of uniting the eyelids, which he has found to give very strong union between the parts. He has often adopted the method after excision of the eye in persons for whom an artificial eye was not desirable. As shown in the diagram, both lids are split deeply, a suture is passed through them, and after "splaying out," as it were, the cut edges, close apposition is secured by tightening the sutures and tying them separately upon the upper eyelid. SYDNEY STEPHENSON.



(17) **MacLennan**, of Glasgow, describes the surgical treatment he adopts to remedy the not uncommon deformity left after tuberculous disease of the malar bone. In the patient, shown in the appended figures, the scar at the outer canthus was freed from the bone by a tenotome, and the skin raised up from the pit in the bone. To retain the skin in its new place, a small piece of fat was excised from the thigh and packed into the cavity under the scar. The small wound was closed with a single suture. When seen a couple of years after the operation, no difference could be made out between the two orbits.

SYDNEY STEPHENSON.

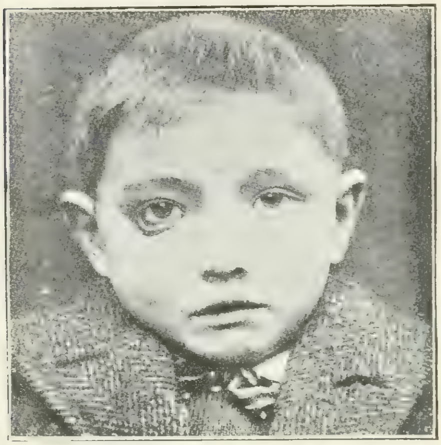


FIG. 1.—Depressed adherent scar after healing of malar tuberculosis.

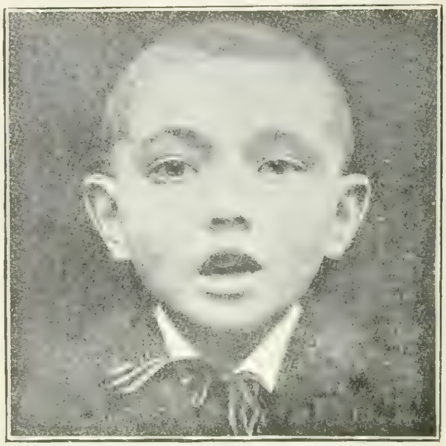


FIG. 2.—Same case as Fig. 1, after elevation of scar, packing with fat taken from the thigh.

VII.—MINERS' NYSTAGMUS.

(1) **Riseley, Stanley.—Should a man with miners' nystagmus work?** *Lancet*, March 1st, 1913.

(2) **Llewellyn, T. Lister.—Miners' nystagmus.** *British Medical Journal*, June 28th, 1913.

(3) **Dransart.—Note on the nystagmus of miners in the north of France. (Note sur le nystagmus des mineurs dans le Nord de France.)** *La Clinique Ophtalmologique*, 10 juillet 1913, 10 août, 1913, et 10 septembre, 1913

(4) **Pollock, W. B. Inglis.—Miners' nystagmus: the stage prior to nystagmus.** *Glasgow Medical Journal*, September, 1913.

(5) **Butler, T. Harrison.—Nystagmus.** *British Medical Journal*, December 6th, 1913.

(1) **Riseley,** of Sheffield, after reviewing the evidence on this subject, takes up the question of the influence of the Workmen's Compensation Act in swelling the list of these receiving permanent compensation in Yorkshire. It

seems that in that county the nystagmus cases have been paid full compensation until they have returned to the pit, and surface jobs have been kept for accident cases. This has resulted in a very great number of claims in Yorkshire. In fact, for one claim in Lancashire there are nine in Yorkshire. The author concludes that when a man claims to be and is admitted to be incapacitated by nystagmus, after a reasonable period, during which he has been under constant observation, if his condition warrants his being employed, he should eventually resume work underground, but as a commencement occupation above ground should be provided. There is no doubt, he says, that a man with bad nystagmus can work and do good work, and is no worse for doing it. Many who are brought in contact with the disease now know that the willing men can work with nystagmus, and are working. Risely pleads that the medical profession should take up a different attitude towards the disease, and instead of immediately looking upon a man with nystagmus as totally incapacitated should, with the exception of serious cases, urge the claimant to continue work, knowing that he can do so without injury to himself. ERNEST THOMSON.

(2) **Llewellyn** (Staffordshire) in a lecture delivered at London on May 31st, 1913, at the Mining Machinery Exhibition, dwelt upon the main features of miners' nystagmus. His remarks were in reality an abstract of his book upon this disease, which was recently reviewed in this journal (April, 1913), at some length, and so it is unnecessary to go over the same ground again. We note, however, that the author has not mentioned exophoria as one of the causes of the disease. Ohm lays great stress upon this symptom, and Dransart finds it in every case, and regards it as the main determining cause. Since reading the views of these two ophthalmologists, we have examined every case which we have seen, and only once did we detect a minimal amount of exophoria. The question has up to the present received no attention whatever in England. T. HARRISON BUTLER.

(3) **Dransart**, of Somain, has come to the following conclusions as to miners' nystagmus in the north of France,.

Miner's nystagmus is a myopathic choreiform affection intimately related to paresis of the interni and to exhaustion of the eye muscles in general. This affection is essentially analogous to the lumbago of miners. It is not a neurosis; it is not of labyrinthine nor yet of accommodative origin. It is caused by the prolonged direction of the gaze above the horizontal line due to the position of the miner working in the seams. The incidence of nystagmus in the north of France is about 15 per cent., with variations from 5 to 25 per cent. according to the pit. Ninety-nine per cent. of affected miners are unaware of their affection, and are not hindered in their work by it. One per cent. of the men affected have functional troubles which put them off work for about twenty days in general, rarely for more than two months. There are three clinical forms of nystagmus, the slight, the medium, and the severe. The frequency of nystagmus, regarded as a disease, is not greater than 1.5 per thousand in the coal workings of northern France. While the *causa causans* is the direction of the gaze, bad lighting and general affections, such as influenza, rheumatism, and pneumonia, intensify the nystagmus. It is the same with wounds of the body and of the eye, Paresis of the interni or of other eye muscles is the predisposing cause of nystagmus.

All the functional troubles observed in nystagmus follow on the paresis, of greater or less degree and variable in the same and in different subjects, of the eye muscles. This has been proved by measurements of the fusion power by Dransart and Vanhoutte. Diplopia, vertigo, ocular oscillations and their variations, and also pains in the head, and blepharospasm have the same origin. Consequently, miners' nystagmus is not a neurosis. As has been said, it is a myopathy analogous to the lumbago of miners, a myopathy which brings about nervous troubles which are inherent in the nature and functions of the organ put in motion by the overtaxed muscles. Among these muscles the internal rectus plays a preponderating *rôle.* All cases of nystagmus, without exception, become cured, and that without interfering with the integrity of the ocular or cerebral functions. Miners' nystagmus is therefore not a grave affection, nor does it constitute a reason for exemption from military service. Hygienic progress, in the works and in the home, tends to diminish the frequence of morbid nystagmus (*nystagmus morbide*). Immediate cessation of work at the pit bottom, the use of tonics and electricity, the wearing of glasses for the correction of ametropia, and prismatic glasses, contribute towards the rapid cure of the condition. Increase of light in the workings will be the main factor in diminishing the number and especially the intensity of cases of nystagmus by getting rid of the first cause, and contrariwise the effects are intensified by bad lighting. ERNEST THOMSON.

(4) **Pollock**, of Glasgow, reaches the following conclusions :—

1. The absence of light is the chief factor in the causation of miners' nystagmus.
2. Snell's myopathic theory has now been abandoned.
3. Nystagmus is the most important, but not the only symptom in a complex neurosis.
4. Three cases have been published, and to these a fourth is added (Pollock's), of the disease occurring without nystagmus.
5. The opinion is advanced (by Pollock) that these cases represent the stage prior to the development of nystagmus.
6. Evidence is brought forward in support of the view (Pollock), published five years ago, that the lesion is situated in the cerebral centres ; most probably the nucleus of the third and associated nerves.

With regard to (4), Pollock's own case is that of a gentleman who suffered from severe vertigo, from dazzling by lights, and from staggering when in the street after dark. He had also hemeralopia. No nystagmus was discovered, there was no diplopia, the optic nerves were normal, and there were no signs of brain tumour. Eventually it turned out, although the patient's present occupation is that of banker, that he had for a number of years been a mine manager, although for four years he had scarcely been down a mine. Pollock concludes, then, that this patient suffered from a type of miners' neurosis.

ERNEST THOMSON.

(5) **Butler**, of Birmingham and Leamington Spa, confirms Ohm's observation, which is to the effect that in some cases of miners' nystagmus the movements of the eyes are not concomitant. On the other hand, among about twenty patients examined with the Maddox rod, Butler found one alone who had about half-a-degree of exophoria. SYDNEY STEPHENSON.

VIII.—REMEDIES.

(*First Notice.*)

(1) **Leprince.—Contribution to the study of tuberculinotherapy. (Contribution à l'étude de la tuberculinothérapie.)** *L'Ophtalmologie Provinciale*, mars, 1913.

(2) **Cuénod and Penel.**—Seven cases of gonococcal conjunctivitis treated by means of a vaccine from the Pasteur Institute of Tunis. (Sept cas de conjonctivite à gonocoques traités par un vaccin de l'Institut Pasteur de Tunis.) *La Clinique Ophtalmologique*, 10 août, 1913.

(3) **Abadie, Charles.**—On ocular tuberculosis. (De la tuberculose oculaire.) *La Clinique Ophtalmologiqne*, 10 août, 1913.

(4) **Darier, A.**—On the influence of antidiphtheritic serum on the progress of ocular infections. (De l'influence du sérum antidiphtérique sur l'évolution des infections oculaires.) *La Clinique Ophtalmologique*, 10 août, 1913.

(5) **Liégard.**—Some cases of interstitial keratitis treated by arseno-benzol. (Quelques cas de kératites interstitielle soignés par l'arséno-benzol.) *La Clinique Ophtalmologique*, 10 septembre, 1913.

(6) **Rudas, Josef.**—On the treatment of trachoma with iodic acid. *Archives of Ophthalmology*, September, 1913.

(7) **Dalencourt, F.**—The medical treatment of cataract. (Le traitement médical de la cataracte.) *La Clinique Ophtalmologique*, 10 octobre, 1913.

(1) **Leprince,** of Bourges, reports the case of a young woman aged 25 years, with tuberculous disease of the eye. As a child of ten years she had an optical iridectomy performed for a dense leucoma of the right eye. Three years ago her left eye was inflamed, but soon recovered under treatment. In September, 1912, the left eye was again attacked, this time very severely. She consulted Leprince for the first time on October 24th, 1912, when there was intense circumcorneal injection, a dull cornea, congested iris, small pupil with numerous exudates in it, posterior synechiæ, photophobia, vision practically *nil* and the fundus invisible. Ordinary treatment with atropin, fomentations, etc., produced no satisfactory results. On October 30th 0·5 c.c. of tuberculin C.L. was injected into the gluteal region, a quantity equal to 1/2000 of a milligramme. As there was no febrile reaction, on November 11th 1/1000 of a milligramme was injected, then 2/1000 on November 23rd, 5/1000 on December 5th, and every twelve days afterwards the amount was increased by 8/1000 according to the *technique* of Professor Calmette. On the 1st of January a distinct improvement was noticed and has since been maintained: the cornea became more transparent, the iris commenced to look healthier, and the pupil to dilate; the vision has improved sufficiently well to allow the patient to return to work.

Leprince mentions that results are not so conclusive in the case of children, but he is of the opinion that tuberculin should always be tried. P. A. HARRY.

(2) **Cuénod and Penel**, of Tunis, have had excellent results by vaccine treatment in cases of gonococcal conjunctivitis in infants and adults. The seven patients were aged respectively 45, 28, 14, 5, 1½ years, 2 months, and 1 month. No eye was actually lost. The authors regard the vaccine as a valuable auxiliary. In adults they use it intravenously, and in new-born children by the subcutaneous route. It gives rise to sharp elevation of temperature, which, however, lasts but a day.* ERNEST THOMSON.

(3) Whatever is written or said by **Charles Abadie**, of Paris, must of necessity command the respect of ophthalmologists, and for that reason one must set out at some length the optimistic views which he has come to hold on the subject of the treatment of ocular tuberculosis.

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* Since the foregoing was written, Cuénod and Penel report further successful cases (*Annales d'Oculistique*, novembre, 1913).—EDITOR.

It must be recognised nowadays, says Abadie, that the tubercle bacillus can penetrate the tissues of the organism almost anywhere, and that while ocular tuberculosis was formerly considered as a secondary infection, it is really more often primary. No previous lesion of the epithelium of cornea or conjunctiva is necessary, and the increasing frequency is thus easily explained. Enucleation of the eye was formerly the usual procedure, and to this day it is almost the only one recommended in most of the classical works on ophthalmology.

It is now nearly ten years since Abadie discovered a purely medical treatment which has given the most remarkable results, and which has entirely changed the grave prognosis of this affection. Not only ocular tuberculosis but tubercle of the sac and lupus are amenable to this treatment. It is, however, very slow in action, and both patient and physician must have much patience and hopefulness. To put it shortly, the treatment consists in (a) the administration of an iodised peptone, which goes under the trade name of "iodogenol." It is administered in the dose of twenty drops twice daily, for an adult, at meal times. It is a *sine qua non* of success that its use be persevered in for years. (b) The daily inunction of two tablespoonsful of the following liniment:—

Cod liver oil	200 grammes.
Guaiacol	15 ,,
Essence de citronelle	4 ,,

(c) The administration of 60 to 100 grammes per day of either raw meat, or, if the patient can afford it, "carnine" or "musculosin," one or two tablespoonsful per day.

One may give, finally, Abadie's reasons for selecting these particular methods of administration. In the first place, the iodised peptone is the most easily tolerated form of iodine. Secondly, the administration of cod liver oil by the mouth has such obvious disadvantages in some cases that it is better to avoid this route. Thirdly, the tubercle bacillus attacks all the tissues of the organism except muscle, and it is known that raw meat and muscle juice are distinct opponents of the bacillus.

At the meeting of the Société Française d'Ophtalmologie, at which Abadie's paper was read, several patients were shown who had been cured of severe forms of tuberculosis, but, of course, only after prolonged treatment.

Ernest Thomson.

(4) In this article **Darier**, of Paris, is replying to one by Janson, from Axenfeld's clinique, in which it is declared that paraspecific serum therapy in the treatment of corneal ulcer and hypopion is quite an untrustworthy method, in favour of which none of the well-tried methods should be abandoned. Darier here points out that he has not advocated the abandonment of well-tried methods of treatment, but has advocated the use of antidiphtheritic serum by the buccal route as an accessory treatment which he is convinced augments the natural defences of the organism. Speaking as an acute clinician (the adjective is the reviewer's), he scoffs somewhat at too much laboratory method and the "massacre of rabbits." Hypopion-ulcer is a disease which demands all the resources of the physician, and it is undoubted that the local applications of chemicals and caustics, and surgical treatment also, are not without their disadvantages. The whole armamentarium may be required, and why not employ one which never does any harm and may do much good?

Ernest Thomson.

(5) **Liégard,** of Paris, after showing that the literature on the subject of the salvarsan treatment of interstitial keratitis is very contradictory in its character regarding results, relates some cases of his own, fifteen in number,

of different types and ages, and of different degrees of ætiological conclusiveness. He classifies his cases into three groups: (1) one case of acquired syphilis with positive Wassermann, (2) nine cases of hereditary syphilis with positive Wassermann, (3) a group of five uncertain cases, three of them having a positive reaction, and two in which the test was not carried out. Liégard's results have been mixed. Some cases have done pretty well, and others have not benefited at all. Admitting with Fromaget, he says, that every treatment directed against "Hutchinson's keratitis," must, in order to be recognized as efficacious, fulfil three conditions, namely: (1) to cut short the disease, (2) notably to reduce its duration, (3) to prevent the affection of the second eye in the course of treatment, he is obliged to conclude that salvarsan is as useless as mercury. All the same, he has noted the remarkable result in more than a third of his cases, that corneæ which were severely infiltrated cleared up completely in five, six, or seven weeks. In other cases there was no such action, and especially in old cases the result was absolutely *nil*. Another point is, that in all cases except one the conjunctival hyperæmia disappeared rapidly in eight or ten days under the influence of salvarsan, while photophobia and lacrymation followed the same course. ERNEST THOMSON.

(6) **Rudas**, of Budapest, has adopted Schiele's treatment of trachoma with iodic acid, and has found it so successful that for some years it has replaced all other methods in his clinic. Iodic acid requires a period of treatment of 44·12 days, as against 64·47 days with other treatments; the number of complications (ulcer and pannus) is ·85 per cent. to 3·25 per cent., the visual disturbance ·51 per cent. to 3·07 per cent. in favour of iodic acid, while relapses are less frequent by 8 per cent.

The conjunctiva is anæsthetised by cocaine, 5 per cent., instilled six to eight times at intervals of one to two minutes (subconjunctival injections are, however, more thorough). The whole of the diseased conjunctiva is then cauterised with iodic acid, a portion at a time, each portion being immediately dried and irrigated with boric solution. The acid may be combined with acoin to reduce pain (acid iodic m.20. Acoin m.2. Gum arabic (or aqua dest.) *q.s.* "*ut fiant bacill.* No. III.") The acid does not attack healthy cornea, nor harm normal conjunctiva: the follicles appear yellow after treatment. The pain lasts for from one to two hours, and may be relieved by cold compresses. A clean wound surface results, and the patient is cured. The parts must be separated daily, to avoid adhesions, for three or four days. Cupro-citrol ointment is used once and later twice daily. The results show complete recovery in the first stage, with slight scarring in moderately severe cases. The treatment may be used even when ulcer and pannus are present.

ROSA FORD.

(7) In this article **Dalencourt**, of Port-au-Prince, merely recapitulates the method of treatment which may be employed in the hope of arresting or curing a cataract which for one reason or another is inoperable. He gives no new facts of his own. The methods are those of L. Dor, eye baths of iodide of potassium and chloride of calcium; of Chevallereau, collyria of iodide of sodium; of Colonel H. Smith, subconjunctival injections of cyanide of mercury. Various other subconjunctival injections may be used. For details the files of THE OPHTHALMOSCOPE may be consulted, as these methods have all been noticed at one time or another. ERNEST THOMSON.

BOOK NOTICES.

International Congress of Medicine, London, 1913. Section IX. Ophthalmology. Part I. London: Henry Frowde, Oxford University Press and Hodder & Stoughton, Warwick Square, E.C. 1913. Price 7s. 6d. net.

This paper-backed volume of 459 pages represents the first part of the proceedings of Section IX, Ophthalmology, of the XVIIth International Congress of Medicine, held in London in August last It contains reports of four discussions, *viz.*, (1) the pathogenesis of chronic uveitis; (2) glaucoma operations; (3) affections of the eye produced by exposure to light; and (4) anaphylaxis in its relation to ophthalmology.

A second part is promised, and we gather that such will include (*a*) reports too late for insertion in the present volume; (*b*) the report of the meetings, and (*c*) the so-called "independent papers."

Disturbances of the Visual Functions. By W. LOHMANN, chief physician to the University Eye Clinic, Munich. Translated by ANGUS MACNAB. London: John Bale, Sons & Danielsson, Ltd. 1913. Price, 15s. net, postage 3d.

This is a book which we heartily commend to such of our readers as take pleasure in passing from the practical exercise of their art to the sciences which lie at its foundation.

There is a borderland between pure physiology and ophthalmology from which many have hoped to derive clinical methods of every-day utility. Frequently, indeed, this hope has been delusive; the study of such subjects as entoptic phenomena, light difference, flicker, etc., has led to little result in the work-a-day world, whether because the observations require too much delicate apparatus and a special training in the use of it, or because the results depend in too high a degree on the intelligent co-operation of the patient. On the other hand, adaptation may be cited as an instance of a physiological subject which has exercised a profound influence on our conceptions of such conditions as retinitis pigmentosa and congenital day and night blindness.

It is with such subjects that Professor Lohmann's book deals, and in a succinct and able manner. An account is first given of the physical, physiological and psychic elements in vision, the latter term including the correction of the visual impressions by the memory and judgment. The psychological, condition of the blind is considered—their power of making use of the other senses, their so-called "sense of place," the visual sensations of the congenitally blind when cured by operation. We must quarrel with the author's statement that "the idea of 'red' to a blind person induces the same sensation as a trumpet." Surely, a congenitally blind person could have no idea of red. The comparison is as old as, and perhaps originated with, Locke, who, however, expresses himself much more cautiously: "The blind man . . . who *fancied* (*i.e.*, presumably, after elaborate explanations, with illustrations drawn from sensations of which he had experience) that the idea of scarlet was like the sound of a trumpet." In fact, Locke adduced this very instance to prove that the blind man could have no understanding of the real nature of colour. (See essay on "Human Understanding," II, iv, 5, and III, iv, 11).

Disturbances of vision due to refractive conditions, and the pathology of entoptic phenomena—metamorphopsia, chromatopsia, phosphenes—form the subject of a chapter, while another deals with abnormalities of peripheral and central vision, amblyopia, nystagmus, scotoma, etc. The author believes congenital amblyopia to be due either to the cones being spaced further apart than normal at the macula, or to the nerve connections from the fovea being more grouped—less isolated—than usual. No mention is made of the important histological examinations of the fovea in congenital nystagmus by Usher, and in albinism by Elschnig, which controvert the first view, and to some extent support the second; perhaps, however, these papers had not been published when the book was written.

In Chapter V an excellent account is given of adaptation and its abnormalities, and this is followed by an admirable summary of the reasons for and against regarding the rod and cone systems as completely isolated, and essentially different in a physiological sense (duplicity theory). Two types of adaptation are distinguished, one characterised by a rapid and great, the other by a slow and restrained, increase of sensibility. The author's researches lead him to believe that the size of the pupil is not without influence on the rapidity of the phenomenon. Pathological variations of adaptation are also divisible into two types; in one, the process begins after the normal interval but progresses slowly, in the other the commencement is delayed. These differences render painstaking investigation essential, and make it necessary to view the adaptation curve as a whole before drawing conclusions. A useful summary is given of the subject of colour vision and its detection, and of colour blindness, including the forms due to disease and to artificial experiments with coloured glasses. Yellow-blue blindness appears to be a feature of diseases of the retina, red-green blindness, of the nerve connections and centres. The chromatopsias also receive consideration.

Among the most interesting portions of the book are those which deal with "co-sensations" and "co-perceptions"—the calling up of sensations of colour, or of pictorial images, by sound. "Colour hearing" is more than an illusion. In its simpler form certain sounds are invariably associated with certain colours—*e.g.*, *a* with black, *e* with green, *i* with red, etc.; in a more developed variety names of persons, days of the week, musical sounds, etc., induce the sensation. In the case of co-perceptions definite pictures appear when music is heard. In all this there is undoubtedly a kernel of reality, and many would recollect a vague experience of the phenomena which are so vividly present to the true colour hearer. The very names of some pieces of music—the Moonlight Sonata for instance—even if not universally recognised as appropriate, show that co-perceptions exist. Unfortunately, exact research is rendered difficult by the fact that when the intellect begins to examine these sub-intellectual phenomena, it is apt to envelop the real in an imaginative web of its own weaving. In any case it is difficult to analyse in what degree these sensations are really intuitive, in what degree dependent on old standing associations of certain sounds with coloured objects—brass bands with red soldiers, for instance; or on the mere poverty of language which leads us to transfer the terms of one art to another—to speak of orchestral *colour* or an *inharmonious* scheme of decoration. On the other hand, it might be urged that the facility with which this transference can be effected is evidence of the wide-spread recognition of a certain degree of co-sensation. Lohmann does well therefore to utter a note of caution; there seems to be no constancy in the colours which different colour hearers associate with the same sound; and certainly the Philistine might jeer when he reads of the confusion which a lady felt between the number 3, the colour yellow, and the diphthong ei; or of the musician who, from ill humour, wore a coat whose colour was in C flat minor, but in order to mollify the beholders, added thereto a collar in E major. Yet Beethoven had a prejudice against the key of B flat, and called it a "*schwarzer Tonart.*"

We have no space to review in detail the concluding chapters on binocular vision, in which an interesting account will be found of Tschermak's classification of squints according to the nature of the localisation of images in the squinting eye; on visual disturbances in diseases of the visual tracts and centres; and on such subjects as memory pictures, hallucinations, etc. Sufficient has been said to indicate the wide range and great interest of the subjects dealt with, and to justify the commendation with which our review began.

A word of praise is due to the translator, and to the publishers for the attractive form of the book. GEORGE COATS.

The After-history of Patients with Parenchymatous Keratitis due to Hereditary Syphilis. (Das Schicksal von Patienten mit Keratitis parenchymatosa auf hereditär-luetischer Grundlage.) By Privatdozent IGERSHEIMER. *Vossius' Sammlung zwangloser Abhandlungen.* Bd. IX, 4 Heft. Halle a. S.: Carl Marhold, Verlagsbuchhandlung. 1913. Price, 1.5 Mark.

Igersheimer's *brochure* is the result of the investigation of over two hundred cases of parenchymatous keratitis, the points mainly kept in view being the ultimate condition of the affected eyes, the effects of the disease on the bodily health, and the possibility of transmission of syphilis by these cases to a further generation.

Interesting figures were obtained with regard to the visual acuity remaining after recovery in 152 eyes. A very small number gave perfect visual recovery, and combining these with those retaining good or useful vision (not less than 5/25), we get 59·2 per cent. of the whole, leaving 40·8 per cent. in whom vision was poor, or useful for coarse work only. Even taking into account the vision of the other eye, the results were very slightly, if at all, better. Myopia was found in about a third of the cases, probably to some extent acquired as a result of the keratitis. The other causes of reduction of vision were corneal opacities, retino-choroiditis, irido-cyclitis, and glaucoma. In some cases, even with good central vision, the patients were rendered very helpless by the presence of a ring scotoma.

As regards "social damage," or the effects of the disease on the working life of the patient, it was found to be least in the case of those who became affected before entering on a definite occupation, for these patients were able to adapt themselves better to their changed circumstances. Those who had already entered on a business career were nearly always compelled to change to some less remunerative occupation; thus, forty-three out of seventy-seven cases suffered permanent loss of earning power. One of the author's tables gives details of the histories of many such cases.

In the matter of prognosis, Igersheimer's experience is that in children during the first ten years of life the duration of the affection is shorter, and the recovery better, than in patients beyond the age of puberty. Where the second eye becomes involved the disease usually reaches the same degree of intensity, and the visual results are not very different, but the duration of the inflammation may be shorter.

The author was the first to undertake systematic tonometric measurements in cases of interstitial keratitis, and some of his results have been already published. During the currency of the disease about 22 per cent. of the cases give lowered tension, 27·4 per cent. have elevated tension, and some show great variability of tension. The use of atropine does not altogether account for the cases of high tension, for atropine was sometimes found to produce an actual fall. He suggests that rise of tension is due to closure of the filtration channels by the products of inflammation ; that fall of tension is due to disturbances of the circulation in the ciliary body ; and that variability of tension is also due to changes in the vascularity of the ciliary body. Low tension practically always returns to normal after cessation of the corneal affection, and the same is true in most cases of high tension, but a certain proportion of the latter show persistent high tension long after inflammation has subsided. In some cases the elevated tension could be shown to have exercised a damaging influence on the vision, through the establishment of a glaucomatous cup with the usual results.

Recurrences were found to occur in 14 per cent. of the cases, from two to ten years after the primary attack. These were usually of a mild description, and less serious as regards interference with vision. He believes that the proper administration of specific treatment for the first attack acts to some extent as a preventive of recurrences.

Apart from the well-known affections of the joints, teeth, ears, etc., which accompany or precede parenchymatous keratitis, the author found that about half of the cases presented some kind of evidences of disease of the central nervous system, in the form of psychical anomalies, fits, disorders of the nerves of special sense, paralysis of the cranial nerves, etc. In some cases these symptoms existed before the keratitis began, but in a large number they appeared after the eye affection had run its course. Taking them as results of the hereditary taint, they still further emphasize the need for energetic specific treatment.

Can syphilis be transmitted to the third generation? The author discusses this point with some care, quoting cases which seem to answer the question in the affirmative, but he points out that we must exclude the possibility of a re-infection in these cases, such an event having been proved to occur.

Everything points to the desirability of early and vigorous treatment in all cases of congenital syphilis. Even if they are seen only after the commencement of interstitial keratitis, the same principle should be followed, in order to prevent recurrences of the keratitis, the occurrence of general bodily disease or disease of the central nervous system, or the transmission of the taint to the next generation. A. J. BALLANTYNE.

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	1914.	
Oxford Ophthalmological Congress	July 8th to July 10th.	Oxford.
British Medical Association: Section of Ophthalmology.	July 15th to July 17th.	Aberdeen.
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ORIGINAL COMMUNICATIONS.

SIX CASES OF TUMOURS OF THE LACRYMAL GLAND, WITH AN ACCOUNT OF THE PATHOLOGICAL FINDINGS.

BY

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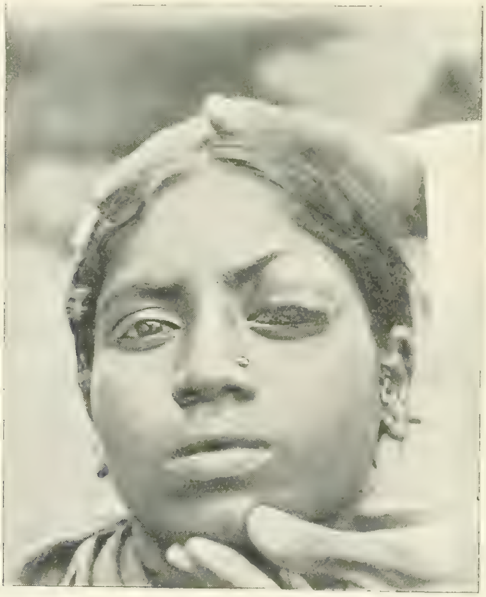
Case No. I.

G. Lakshmakka, *æt.* 18 years, Hindu female, admitted to the Government Ophthalmic Hospital, Madras, under the care of Colonel Elliot, on June 11th, 1910. Operated on June 18th, 1910, and discharged on July 13th, 1910. *Disease:* tumour of the left lacrymal gland.

History.—The patient says that she noticed a small swelling, about the size of a pea, on her left upper lid over a year ago. It commenced close to the seat of the lacrymal gland, and has been growing steadily. For the last month there has been constant, dull, aching in and around the swelling. There is also increased lacrymation and some discharge from the eye. No headache.

FIG. 1.

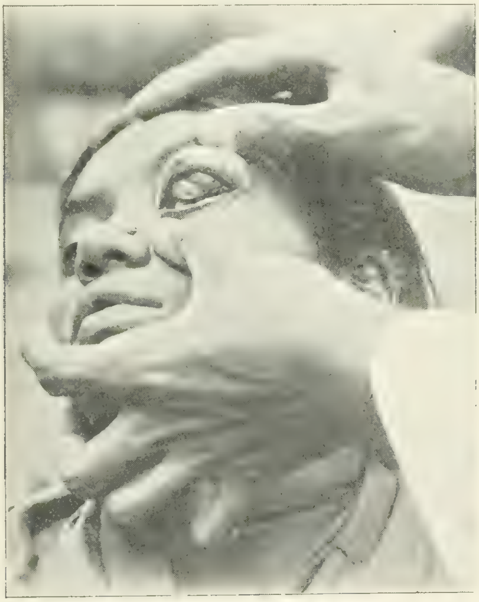


G. LAKSHMAKKA.
The tumour as seen from in front.

The first photograph (Fig. 1) shows the appearance of the tumour as seen from in front, whilst the second (Fig. 2) shows the mass evidently representing the accessory portion of the gland. The latter has obliterated the conjunctival *cul-de-sac*, and is firmly adherent to the conjunctiva in this region.

Present Condition.—The edge of the upper lid is thickened, and the conjunctiva is inflamed. The conjunctival surface of the tumour is reddened, irregular, and granular in appearance. The skin shows a number of large veins. It is not adherent to the tumour at any part; but it is slightly congested. The tumour is rather firmly fixed, but admits of a certain amount of movement over the bone beneath it. The skin surface of the growth feels very hard, is knobby and irregular, and gives the impression of a cartilaginous tumour. On pressing firmly downward, the tumour can be distinctly separated from the orbital margin, a groove being felt between them. The movements of the eyeball inward and downward are free, outward very limited, and upward limited to the horizontal plane. The eyeball is somewhat rotated downward, and appears to be indented by the pressure of the growth which has pushed the conjunctiva in front of it nearly up to the margin of the cornea. Its firmest point of attachment seems to be at the usual seat of the lacrymal gland. It measures 43 mm. in length, 35 mm. in breadth, and 23 mm. in thickness. The conjunctival *cul-de-sac* is of normal depth on the inner side, but towards the outer side it becomes shallower to eventual obliteration.

FIG. 2.



G. LAKSHMAKKA.
Showing the mass evidently representing the accessory portion of the gland.

Operation on June 18, 1910.—An incision was made below the eyebrow and the tumour was shelled out entire. Its firmest attachment was in the fossa of the lacrymal gland, but there was no bony attachment, simply that by fibrous tissue. No trace of the lacrymal gland as an independent structure could be found; that portion of the conjunctiva which was adherent to the accessory portion of the tumour was necessarily sacrificed. The conjunctiva was sutured up, a fair covering being thus obtained. The eyeball was not at all interfered with. The skin wound was closed by three sutures.

The case did well, although the scar was somewhat adherent to the bone of the superciliary ridge, and there was some drooping of the lid. On discharge, massage was advised for this.

The patient returned two years later with a huge inoperable recurrence.

R. H. E.

Pathological report on Specimen.

The tumour appeared to be completely encapsuled and of a soft cartilaginous consistency. On section, the surface presented a smooth, translucent, greyish-white appearance, with no trace of glandular structure or arrangement.

Microscopically, the tumour was found to consist of numerous cellular alveoli, arranged most irregularly, in a faintly fibrillated matrix. The alveoli were mostly irregular in size and shape, and were very irregularly distributed, some portions of the tumour containing numerous large alveoli, with very little interstitial tissue, and other parts few and small alveoli, with much interstitial tissue. The alveoli were full of small irregularly polygonal cells containing pale staining nuclei, and presenting all the appearances of cells derived from glandular epithelium. Many of the cells were vacuolated, and some of the alveoli showed rounded empty spaces resembling the lumen of a glandular alveolus, but these spaces were most irregularly placed in the alveoli ; sometimes these spaces contained granular material. The interstitial tissue presented a peculiar hyaline appearance, with faint fibrillation in places ; there were no cells whatever to be found in the interstitial tissue.

The specimen had been preserved in formalin, but immediately on receipt portions were removed and placed in formol-Müller, and these were subsequently stained by Beckton's method. Many of the cells of the aveoli were found to contain Altmann's granules in small numbers.

It is very difficult to classify this tumour, but the appearance of the sections closely resembles Fig. 541, p. 755, Vol. II, Parson's "Pathology of the Eye," 1905. I am therefore inclined to class it as a mixed tumour of a nature similar to the tumours found in the parotid gland. The presence of Altmann's granules, in spite of immersion in formalin solution, makes it highly probable that the cells were of epiblastic origin, since mesoblastic cells after treatment with formalin, do not, in my experience, show Altmann's granules. A. C. I.

Case No. II.

K. Munusamy, *æt.* 3 years. Hindu male child. Admitted to the Government Ophthalmic Hospital, Madras, under the care of Colonel Elliot on August 16th, 1910, and discharged on September 2nd, 1910. *Disease:* Tumour, left eye. Duration of disease not ascertainable.

History.—The mother first noticed a fleshy growth on the outer margin of the eyeball, which has rapidly grown to its present size. She states that no treatment whatever had been applied.

Present condition.—There is a fleshy exuberant growth protruding through the lids and overlying the eye. It fills and stretches the lids. There is a condition resembling enormous chemosis surrounding a deep fissure with what appears to be the remains of the destroyed cornea and iris at the bottom of the cleft. The eyelid is stretched over a hard irregular growth which appears to spring from the lacrymal fossa and to be situate in the lacrymal gland. It spreads, however, right across to the nasal side. The fingers can be pushed slightly between the tumour and the orbit. The growth is firmly fixed. The preauricular glands and those of the neck are free.

Operation on August 20th, 1910.—Incisions were made over the margin of the orbit all round and the tumour was then removed, together with the shrunken eyeball. It extended a long way back, practically to the apex of the orbit, and was so hard that it was very difficult to get the finger between it and the bony wall of the cavity. The optic nerve was seen running round the growth on its inner side, where it apparently entered the shrunken atrophied eye. On removal, the tumour was cut into. It proved to be of cartilaginous consistency and cut with a "creak"; it was encapsuled and apparently the whole of it had been removed. The orbit was, however, cleared out; there was not much hæmorrhage, and the operation was well borne.

Measurement of growth on admission: (1) from the outer angle of the orbit to the most anterior part of the tumour 30 mm., (2) from the inner to the outer angle of the orbit, 40 mm., (3) the fleshy protruding portion stands out 20 mm. from the face; (4) the fissure in the centre of the fleshy growth is 12.5 mm. deep, the eye lying at the bottom of it.

Remarks.—The pathological report (see below) came as somewhat of a surprise. The hardness of the tumour before removal strongly suggested that it was cartilaginous and the way it cut after removal strengthened the idea.

October 25th, 1910.—The patient returned with a large recurrence *in situ*. The growth was irregular and hard, and there were large veins over it on the surface. The child was cachectic and feverish. No enlargement of the spleen, liver, or lymphatic glands except those of the posterior cervical and submaxillary. Further interference was not deemed advisable. R. H. E.

Pathological Report on Specimen.

Specimen received in formalin two days after operation. The tumour consisted of a large firm irregular mass of white colour, and was apparently completely encapsuled. The eyeball was embedded in a fissure on the surface of the tumour, and was shrunken to a pear-shape. On section, the tumour was found to be tough in consistency and its surface presented a smooth white faintly marbled appearance.

Microscopically, the tumour was found to be composed of interlacing bundles of spindle cells of varying size interspersed with a variable amount of fibrous connective-tissue. Many of the spindle cells were large with large oval nuclei, staining with moderate intensity; some, however, were smaller with dark staining oval nuclei. A comparatively small number of ill-formed thin-walled small blood vessels were present. In parts the tissue appeared to be undergoing myxomatous degeneration. No defined capsule could be found in the microscopical sections.

The diagnosis rests between a fibroma and a spindle-celled sarcoma. On account of the nature of the cells, and the presence of thin-walled ill-formed blood vessels, I think it is probably a spindle-celled sarcoma. A. C. I.

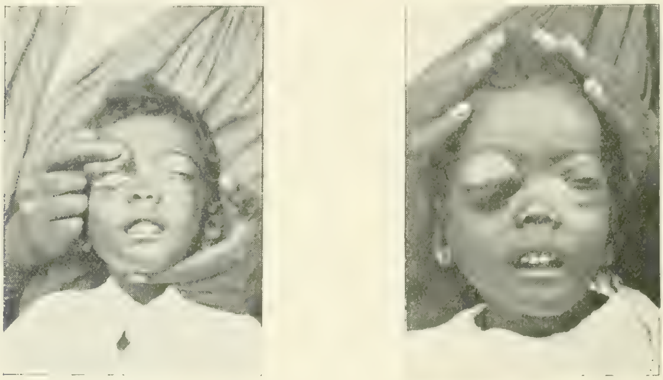
Case No. III.

Kannammal, aged three years, Hindu female child, admitted to the Government Ophthalmic Hospital, Madras, under the care of Colonel Elliot on October 6th, 1910. Discharged on October 21st, 1910. *Disease:* Tumour of the lacrymal gland (both sides).

History.—The mother states that about three months ago, she noticed in the child's right upper lid at the outer angle some swelling and redness with watery discharge. There was not much pain in the beginning. The swelling gradually increased, and for the past ten days the part has been considerably swollen and painful; the child has not been sleeping well and is getting fever in the evenings. She noticed a similar swelling in the left eye also about four days ago.

Present Condition.—On examination under chloroform. *Right Orbit.*—There is a large firm irregular tumour with a granular surface lying above and to the outer side (Figs. 3 and 4). It admits of a certain amount of movement in all directions; it is not attached to the orbital bones; it pushes the congested conjunctival fold before it. It lies entirely above the eyeball. The little finger can be got between the eyeball and the lower and inner walls of the orbit and feels no growth there. It is very difficult to follow the growth with the finger, owing to want of room, but it appears to stretch back a considerable distance and it is clearly responsible for the forward and downward proptosis. The tumour is very distinctly divided towards the nasal side into two lobes, the horizontal sulcus between them passing back to the mid-line of the orbit. It strongly suggests the division into the main and accessory parts of the lacrymal glands, seen in other tumours of the organ.

Fig. 3. Fig. 4.



Kannammal.

Left Eye.—There is forward and slightly upward proptosis. A nodule of growth can be felt between the eye and the orbit at the lower and inner angle of the orbit. It communicates a hard fibrous granular sensation. The orbit feels unduly full. Nothing can be felt above the eyeball, the growth appearing to originate below and from the inner side. The bridge of the nose is very low and the nose is filled up with growth, the nares being practically obliterated. A growth also bulges through the anterior wall of the antrum on each side. It was not thought justifiable to interfere with the case.

Remarks.—The history suggests that the first of the multiple growths affecting the child began in the upper-outer angle of the right orbit and the tumour there clearly lay in the lacrymal gland. What connection, if any, this had with the central growth of the same side or with the orbital, antral, and ethmoidal growths of the opposite side, we were quite unable to ascertain.

The case was lost sight of. R. H. E.

Case No. IV.

Abdul Masjid, *æt.* 35 years, Muhammadan male, residing at Ellore, merchant, admitted to the Government Ophthalmic Hospital, Madras, under the care of Colonel Elliot, on November 24th, 1910, and was operated on December 10th, 1910. *Disease:* Tumour of the left lacrymal gland.

History.—The patient says that about two months ago he had an oil inunction one evening and went to bed. The next morning he was surprised to see a swelling of the left eyelids; it was unaccompanied by any pain or congestion of the eye "as if from renal trouble." He did nothing for this in the way of treatment. About ten days ago, he felt a little pain in the eye, and noticed it was red, and for this he came to Hospital and drew attention to a fleshy growth at the upper and outer corner of the eye. The patient gives no history of syphilis.

Present Condition.—The lids of the left eye are œdematous and the upper one droops. Externally the swelling is very marked over the seat of the lacrymal gland; it extends as far as the inner canthus of the eye. There is distinct proptosis, the eye being pushed markedly forward and somewhat inward and downward. On pulling up the upper eyelid, a rather vascular, soft swelling, measuring 10 mm. laterally, is noticed, projecting into the conjunctival sac at the upper and outer corner of the eye. It admits of but slight movement over the deeper parts; the superjacent conjunctiva is congested and adherent; this lobule of growth is continuous above with the flat rather sharp-edged mass which occupies the outer three-fifths of the upper orbital margin. The latter mass is rather hard to the feel, is capable of slight movements on the deeper structures and appears largest over the seat of the fossa for the lacrymal gland; it appears to be attached in that neighbourhood; it has rather a granular surface feel, which is more marked over the lobe which projects through the fornix.

All movements of the pupil are normal. Tension normal. Other parts of the eye are normal. The movements of the eyeball are very distinctly limited upward and outward, but free in other directions. There is no enlargement of the glands, either local or general.

November 25th, 1910.—R.V. = 6/12; − 1·0 sph. = 6/6. L.V. = 6/24 bar 1 letter; − 1·0 sph. = 6/9 bar 1 letter.

Ophthalmoscopic Examination.—Left eye. Very well-marked venous pulsation. Engorgement of veins. Cornea a little steamy, making details slightly indistinct. Slight general congestion of the eye.

Patient was kept under observation, and for a fortnight was given a mixture of liquor hydrargyri perchloridi and potassium iodide (gr. xlv in twenty-four hours). The tumour distinctly increased in size whilst he was taking the medicine, and that part of it which projected under the conjunctiva increased from 10 mm. to 11.5 mm. in lateral measurement. The main body of the growth spread along till it nearly reached the internal canthus, and at the same time its sharp anterior edge became very distinctly thicker and more rounded. On December 9th, 1910, the part measured 45 mm. horizontally by 35 mm. vertically. Vision the same as it was on November 25th, 1910. Urine: acid; no albumen or sugar.

December 10th, 1910.—At my request, Major Symons, assisted by Captain W. C. Gray, performed Krönlein's operation, and found the tumour to be lying immediately below the periosteum. In shape it was like a curved prism with the base forward and the apex extending backward along the roof of the orbit. The main mass lay externally and stretched back practically to the posterior limit of the orbit. The tumour was continuous with the lobe of growth which had been felt and seen projecting into the conjunctiva and which was shelled off it. The growth lay outside the cone of muscles and against the periosteum and had obviously originated in the lacrymal gland. No trace of that gland could be found apart from the tumour. The extensive wound was sutured up and drainage gauze inserted. The case did well.

Pathological report by Major H. Kirkpatrick, I.M.S., Professor of Pathology, Medical College, Madras.

Section (*a*). A caseous mass surrounded by a dense fibrous tissue, in which are a few fibroblasts ; further from the caseating area the section is composed of fibroblastic cells, amongst which a considerable amount of fibrous tissue has formed. The vessels show endarteritis.

Section (*b*). Tissue much same as outer zone of (*a*), except that there is less fibrous tissue and some fat is present.

Result of Examination.—I consider the growth to be probably syphilitic in nature.

Sequel.— In my absence from India the patient returned ten months later with a massive recurrence of the growth, accompanied by fever. Iodide of potassium was tried without obtaining any benefit, and further operation was deemed inadvisable. The clinical course of the case has therefore been throughout at variance with the pathological findings. R. H. E.

Case No. V.

Ramamma, *æt.* nine years, female child, Hindu, residing at Bapatla, was admitted to the Government Ophthalmic Hospital, Madras, on April 27th, 1911, under the care of Colonel Elliot, for tumour of the left lacrymal gland.

History.—Some fifteen days ago, the girl suffered from fever for two days, and on the third day the eyeball was observed to be protruding (history valueless.)

Present Condition.—The eyeball is pushed forwards, downwards, and outwards. There is a hard mass between the rim of the orbit on the right side and the tarsal cartilage on the left, measuring 20 mm. horizontally and about 6 mm. vertically, commencing from the middle of the left eyebrow, running outwards parallel to it, and extending as far as the external angular process of the frontal bone. The skin over it is slightly congested and freely movable. The superficial veins are distended. The conjunctiva of the upper lid is congested, and near the outer angle of the eyeball it is pushed forwards by the growth. There is profuse watering of the eye. The plica semilunaris is prominent and congested. The palpebral conjunctiva of the lower lid is highly vascular. The episcleral vessels are a little prominent. The patient can close her lids completely without trouble, but the palpebral aperture is a little widened. The eyeball movements are free in all directions, except that they are limited upwards and outwards, probably mechanically so. The edge of the tumour is rather sharp and has a granular feel, like a finely cirrhosed liver. The accessory lobe can be seen pushing the conjunctiva before it at the outer canthus. The tumour is somewhat hard to the touch, and appears to go a long way backwards. L.V.=5/15 ; R.V.=5/5.

April 29th, 1911.—Krönlein's operation by Major Symons. The incision was extended below the eyebrow. The tumour was roughly prismatic in shape. The growth was roughly triangular with rounded edges. It was thicker in the middle and thinned out towards the edges on all sides. The small accessory portion of the tumour corresponding to the accessory lobe was removed with it. The growth had a greenish look. On section, it was very green in colour and was highly vascular, with hæmorrhages on the cut surface. Whilst the surface of the tumour was quite smooth, the bone adjacent to it was extensively rough, very markedly so indeed. The growth went back a very long way both above and on the outer side ; the plate of bone was replaced, the wound was closed, and a small drainage tube was inserted.

After-course of case.—The patient never did well, the growth recurred within two months, and death occurred a fortnight later. R. H. E.

Pathological report on specimen.

The tissue consists of fibrous stroma, forming a very irregular network in which lie numerous small round cells and some red blood corpuscles. In parts the stroma is much denser and in one part of the slide, in the dense somewhat degenerate stroma, are a number of small irregular masses staining deeply with hæmatoxylin, which I think are probably calcareous in nature.

The small round cells appear to be slightly larger than lymphocytes, their nuclei do not stain deeply, and they possess a small quantity of protoplasm. There are very few blood-vessels to be seen and nearly all those visible are capillaries.

There is no trace of glandular tissue.

I am of opinion that the growth is most probably a small round-celled sarcoma. A. C. I.

Remarks by Lieut.-Col. Elliot.

It will be observed that my own five cases presented themselves within a period of eleven months. Within the same period occurred a case of Mickulicz's disease which Captain Ingram and I published it in the February number (1911) of THE OPHTHALMOSCOPE. On searching the books of the Hospital for the past five years, no previous record of the growth of the lacrymal gland can be found. The extraordinary coincidence of this large number of cases of new growth of this gland, occurring in so short a period, seems of itself to justify the publication of the notes.

There were several outstanding features of these cases which it may be of interest to call attention to :

(1). The growths stretched very far back, much further indeed than an examination would lead one to expect. This is in accordance with the experience of others.

(2). In four out of the five cases the growth was very hard.

(3). In every early case the accessory portion of the lacrymal gland was invaded by the growth and presented a characteristic appearance. On eversion of the lid, it looked almost as though an almond had been let in under the conjunctiva.

(4). Even allowing for the unreliability of Indian histories, one cannot fail to be struck with the very rapid course run by these tumours. An early recurrence would also appear to be probable, even in the case of a most thorough removal. In the case of Munusamy the tumour appeared to be absolutely encapsuled, and yet a large local recurrence was found two months after operation.

(5). A granular feel would also appear to be a common feature in malignant tumours of this gland.

(6). The patients' homes were scattered all over the south of India, and one can find no factor to explain the extraordinary coincidence of so many cases in so short a period. R. H. E.

Case No. VI.

A case of lacrymal gland tumour by Captain A. C. Ingram, M.D., I.M.S.—Kamakshi, a Hindu woman, aged 30 years, was admitted to the Government General Hospital, Madras, on April 8th, 1909, operated on by myself, on April 21st, 1909, and discharged on May 26th, 1909.

The patient stated that a swelling appeared in the outer side of the left eyelid about four months previously. At first, small and painless, it gradually increased in size and became painful. One month previously, the left eye was affected, and very soon became totally blind. On admission, the outer-upper angle of the left orbit was occupied by a soft ill-defined vascular tumour, of considerable size, over which the upper eyelid and conjunctiva were stretched. There was superficial ulceration of the conjunctiva over a small area on the most prominent part of the tumour. This ulcerated area bled very readily. The cornea was completely nebulous, so that the condition of the eye could not be made out. The tumour appeared to arise from the lacrymal gland, and was fixed to the sclerotic on the outer side of the eye, but the tumour could be moved slightly from side to side within the orbit.

On April 21st, 1909, the whole orbit was exenterated, the tumour, eye, and almost all the skin of the upper eyelid being removed *en masse*, together with a portion of the periosteum covering the outer part of the orbital plate of the frontal bone. There was not very much bleeding.

The wound rapidly granulated up, and the surface, after skin grafting, healed over completely.

Nothing is known about the subsequent progress of the case. A. C. I.

Pathological Report on Specimen.

A very thorough examination was made of a large number of sections of this tumour. It proved to consist of irregular branching columns and masses of cells embedded in a matrix of loose fibrous tissue. The cells were nearly all degenerate. No trace of glandular tissue could be found. On the whole, I am of opinion that the tumour was an endothelioma. From a consideration of the history and clinical signs and symptoms, I am further of opinion that the tumour probably originated in the lacrymal gland. A. C. I.

General Remarks.

In two cases the pathological diagnosis is that of endothelioma ; two are sarcomata, one with spindle and one with round cells ; one was not examined ; and the last is stated by competent pathologists to have presented all the appearances of a syphilitic gumma, and yet the clinical observation before removal pointed distinctly to a malignant tumour—a diagnosis which was fully confirmed by the very malignant recurrence. We are greatly indebted to Major Kirkpatrick for examining the specimens for us. They were also sent to Mr. A. C. Hudson, who very kindly examined them and favoured us with his opinion on each of them. We are under a great obligation to him for doing so.

(FROM THE INSTITUTE OF PHYSIOLOGY, UNIVERSITY COLLEGE, LONDON.)

DICHROMIC VISION

BY

F. W. EDRIDGE-GREEN, M.D., F.R.C.S.

(Concluded.)

3.				4 (A)	180 meter candles.			4 (B)	2·0 meter candles.		
No. of Regions.	λ	δλ	Colour Name.	No. of Regions.	λ	δλ	Colour Name.	No. of Regions.	λ	δλ	Colour Name.
1	775 653·5	122	Red	1	680 506	174	Orange-Yellow	1	650 501	149	Red-Yellow
2	653·5 517	136	Yellow	2	506 500	6	Yellow-Grey	2	501 489	12	Grey
3	517 506	11	Green	3	500 495	5	Yellow-Grey	3	489 461	28	Blue
4	506 494	12	Green	4	495 492	3	Grey				
5	494 484	10	Blue	5	492 487	5	Blue Grey				
6	484 473·5	11	Blue	6	487 482	5	Blue				
7	473·5 416	57	Blue	7	482 420	62	Blue				

Length of Spectrum, 359. Length of Spectrum, 260. Length of Spectrum, 189.

5. No. of Regions.	λ	δλ	Colour Name.	6. No. of Regions.	λ	δλ	Colour Name.
1	730 509	221	Yellow	1	780 536	244	Yellow
2	509 505	4	Green	2	536 502	34	Yellow
3	505 497	8	Green	3	502 493	9	Yellow
4	497 493	4	Blue-Green	4	493 486	7	Yellow
5	493 489	4	Blue-Green	5	486 480	6	White
6	489 426	63	Blue	6	480 395	85	Blue
7	426 410	16	Blue	7			

Length of Spectrum, 320. Length of Spectrum, 385

7.

No. of Regions.	λ	δλ	Colour Name.
1	735 605	130	Yellow
2	605 534	71	Yellow
3	534 499	35	Yellow
4	499 492	7	Green
5	492 482	10	Blue-Green
6	482 414	68	Blue

Length of Spectrum,
321

8.

No. of Regions.	λ	δλ	Colour Name.
1	675 510	165	Red
2	510 500	10	No colour Red-Green
3	489.5 489.5	11	Green
4	479 479	10	Blue-Green
5	410	69	Blue

Length of Spectrum,
529

9.

No. of Regions.	λ	δλ	Colour Name.
1	700 526	174	Orange
2	526 509	17	Orange
3	509 501	8	Bluish-Yellowish
4	501 491	10	Blue-Grey
5	491 412	79	Blue

Length of Spectrum
288

10A.	180 Meter Candles.		
No. of Regions.	λ	δλ	Colour Name.
1	690 506	184	Red
2	506 493	13	Reddish Grey
3	493 487	6	Bluish Grey
4	487 421	66	Blue

Length of Spectrum,
269

10B.	2·6 Meter Candles.		
No. of Regions.	λ	δλ	Colour Name.
1	647 530	117	Red
2	530 514	16	Dirty Red
3	514 503	11	No Colour
4	503 435	68	Purple

Length of Spectrum,
212

11 No. of Regions.	λ	δλ	Colour Name.
1	635 503	132	Yellowish-Red
2	503 494	9	Yellow-Green
3	494 482	12	Blue-Green
4	482 415	67	Violet

Length of Spectrum,
220

12 No. of Regions	λ	δλ	Colour Name.
1	718·5 509	209	Red
2	509 498	11	Dirty Yellow
3	498 488	10	No Colour
4	488 406	82	Blue

Length of Spectrum,
312

13. No. of Regions.	λ	δλ	Colour Name.
1	675 494	181	Yellow
2	494 487	7	Pale blue
3	487 413	74	Blue

Length of Spectrum,
262

14. No. of Regions.	λ	δλ	Colour Name.
1	665 498	167	Yellow
2	498 429	69	Blue

Length of Spectrum,
236

Varieties of Dichromic Vision.

In addition to the varying hue perception which is found with different dichromics, there may be associated defects of light perception. There may be shortening of the red or the violet end of the spectrum; there may be defective perception for some of the other spectral rays; the luminosity curve may have its maximum at a different place to the normal; there may be defective perception when the image on the retina is diminished in size; and the size of the neutral region is very variable. All these defects produce their characteristic symptoms. Of the large number of cases which I have examined I have not found one which, when examined in the manner I have described, would support either the Young-Helmholtz or Hering theories. It can be easily shewn that the defect which has caused the non-perception of certain rays has not caused the dichromatism. For instance, the red may be shortened to λ680; at λ670 the perception of red may be defective to about half the normal, and at λ660 it may be quite normal. If we now test such a case with spectral colours, from λ660 onwards to the violet end of the spectrum, we find that the perception of luminosity, *i.e.*, differences of light and shade, is identical with the normal. Thus the subtraction of the element which causes the non-perception of certain rays, cannot be responsible for the dichromic vision which extends from λ660 to λ385.

In estimating defects of light perception, *e.g.*, shortening of the red end of the spectrum, colours should be directly compared, in order to ascertain their comparative luminosities. For instance, light of λ589 can be compared with light of $\lambda 570$ and $\lambda 535$. A comparison with white light gives rise to results which are very fallacious. Not only have the missing red rays to be subtracted, but if the individual have a spectrum which is lengthened at the violet end or is more sensitive to any other rays than the normal, a coefficient corresponding to these rays must be added. Therefore, if a represent the missing red rays and b the added violet rays, the formula of white light as seen by the individual in question, as compared with the normal, will be white $-a+b$.

Still more difficult to explain on any light perception theory are the cases of so-called green blindness. These, as I have shewn,[5] are simply cases of dichromic vision without shortening of the spectrum, and, indeed, with no defect in light perception in any part of the spectrum. If to such persons we give colours to compare which differ only slightly in shade, but are absolutely different in hue, we find that their selection of the lightest or darkest corresponds to that which would be made by a normal individual. A red and a green, or an orange and a green, will be selected, which to the normal eye, match exactly in shade, *i.e.*, luminosity. I have also examined a dichromic of this kind with faint green lights: these were viewed from a distance through blue-green glasses so that all light supposed chiefly to affect the hypothetical red sensation elements should be cut off, but the lights were visible to him up to their point of disappearance for me.

The varying size of the neutral region causes different symptoms. When this is extensive, only violet and red may be seen in the spectrum, yellow, blue, and green being confused with each other, and with grey and purple. A case of this kind, at first sight, appears to be one of the so-called blue-yellow blindness, but it must be noted that both colours are confused with green. A common mistake of a person of this kind is to confuse a sovereign with a shilling.

Nature of the two Colour Sensations of the Dichromic.

There has been much discussion as to the nature of the two colour sensations of the dichromic, whether they correspond to any of the normal colour sensations or whether they are quite distinct. In dichromic cases in which only two colours are seen in the spectrum, it is obvious that any portion included in the monochromatic area might be taken to represent that area. If in the evolution of the colour sense the first two colours to be discriminated were red and violet, these two colours should be most representative of the two colour sensations. I am now convinced that this is the case, and that the two colours seen are a red and a violet, with less colour difference between them and less saturation than the red and violet seen by the normal sighted. Two cases which I have examined throw light upon this point. One was colour-blind with one eye only, and he said that he saw the spectrum with this eye as nearly all grey, but with a tinge of red at one end and a tinge of violet at the other. The other case was a woman who had become totally colour-blind as a sequela of ear disease. She was sent to me when she had regained a certain amount of colour sensation. She also saw the spectrum nearly all grey with red at one end and violet at the other. In those congenital cases in which the two sensations are separated by a wide neutral portion the observer emphatically declares that the two colours which he sees are red and violet.

In other cases, in which there are several differences of colour to be seen in each of the two divisions of the spectrum, there is more difficulty. Many dichromics of this kind declare that yellow and blue are the two colours which they see in the bright spectrum. I also stated in my earlier writings that yellow and blue were the two most representative colours, because of their superior luminosity and the fact that they occupy central positions in the two sections of the spectrum. When no colour difference is seen between red and yellow, either colour may be chosen as representative when both are of the same luminosity. When, however, a colour difference is seen, an increased colour saturation may be made visible in the red when this is increased in luminosity, which shows definitely that red and violet are the two colours presenting the greatest difference. In fact, I find that most acute observers express the opinion that though yellow may be the brightest, red has the most colour in it of the same kind. I will give an illustration of this from the writings of Pole,[6] a so-called red-blind. I do this more readily because Pole was one of the strongest advocates of the view that the two sensations of the dichromic are yellow and blue, so that observations made by him against this view are particularly convincing. He writes, referring to the change in the appearance of red in gaslight compared with daylight :

"The change in the lighter reds is very astonishing, and the full red by gaslight is to me a most 'superb' colour. Dalton could never bring himself to believe it was really a yellow sensation. I have heard other colour-blind persons declare it to be a red which only appears in that way ; and although I myself cannot detect any new colour sensation in it, I am obliged to admit that as yellow, it is extraordinarily saturated and powerful. There seems something about this change that deserves further inquiry."

In gaslight there is an increased proportion of red rays compared with daylight.

The case of Doctor Pole illustrates the artificiality of the division into red and green-blind. He writes that Maxwell said he was red-blind, but on sending his matches to Holmgren, the latter declared that he was green-blind. I examined him, and came to the conclusion that he was a simple dichromic, and this is the opinion he himself held. I examined him particularly with regard to luminosity. I tested him with some wools which were very nearly alike in shade, and in each case he pointed out the darkest correctly. Shades of red and green and green and violet were matched correctly as far as luminosity was concerned. I have given an account of his case in my book.[7]

Summary.

(1.) There are many degrees and varieties of dichromic vision.

(2.) There are not two well-defined varieties of dichromic vision, there are innumerable gradations connecting the two.

(3.) In many cases precisely the same errors are made both by those with and those without defective perception of red, when the rays for which there is defective perception are not involved.

(4.) All dichromics are not equally colour-blind, that is, one may have a much better hue perception than another.

(5.) Dichromic vision may be associated with defects of light perception which are also found in cases in which the vision is not dichromic.

(6.) Dichromics may have a perception of shade and a luminosity curve similar to the normal.

(7.) Many dichromics match very accurately, their colour perception being sufficient for the purpose when the colours are not too close in the spectrum.

(8.) The degree of colour-blindness varies with the state of health.

(9.) Colour discrimination is diminished as a whole in dichromic vision.

(10.) Dichromic vision appears to be due to a defective power of colour differentiation probably corresponding to an earlier state in evolution of the colour sense.

(11.) The two colours seen are red and violet.

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THE END.

AN INQUIRY REGARDING INCREASED TENSION OF THE EYEBALL.*

BY

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IT is not without a sense of embarrasment that I venture to bring before you a paper on any phase of glaucoma after the delivery of Col. Elliot's admirable address, based upon his enormous experience at Madras. My hesitation is the more pronounced for the reason that my remarks are based so largely upon my personal observations and study in a comparatively limited field. The inquiries and suggestions of this paper were formulated during my vacation in July and August of the present year, before the presentation in England of Col. Elliot's results and conclusions. Since its presentation, however, I have had the opportunity to consult the work, as published in THE OPHTHALMOSCOPE, and am gratified to note that in his discussion of some of the ætiologic factors his views are entirely in accord with those I have sought to present.

I must, however, before proceeding, make my apologies for confining these remarks so largely to personal experience and the inquiries awakened in my own mind by this experience. It is not necessary in this presence even to epitomize the views set forth by others in the vast literature of the subject.

From my earliest years of ophthalmic practice to the present time, like some hardy perennial, increased tension of the eyeball has thrust itself upon my attention, not only in text-books and medical journals, but in the daily routine of professional work. From the private consulting room and public clinic, in isolated examples and groups of cases, glaucoma in some of its protean manifestations has never been absent, and has always presented a sufficient cause for anxiety to both patient and surgeon.

It is significant not only of the importance and gravity of increased tension of the eyeball, but of the unsettled state of our knowledge that, notwithstanding this wide opportunity afforded for its study, journal literature has never, since the publication of von Graefe's notable paper on iridectomy in 1856, been more replete with discussion of its pathology, or the expression of varying views as to the nature of the disease; or, with the promulgation of newly invented procedures for its surgical treatment. To me increased tension of the eyeball still constitutes one of the most perplexing and discouraging chapters in ophthalmology. We must admit, in a word, that Priestley Smith's definition that "Glaucoma is increased tension of the eyeball plus causes and effects" still defines and outlines our understanding of the disease.

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Notwithstanding this discouraging state of our knowledge, there are rays of hope shed upon the subject by a more correct understanding of the anatomy and histology of the eye and of the essential nature of certain systemic conditions associated with the increased tension of the eyeball. If we pass rapidly in review before our minds the considerable group of ocular conditions which either culminate in increased tension or threaten to do so, we shall be impressed by certain significant facts. For example, if we consider the atypical forms of glaucoma:—(a) the buphthalmic eye of infancy and young childhood; (b) the cases of serous iritis; (c) chronic, recurrent iritis of the plastic type; in each we find increased tension, seriously impaired acuity of vision, and, when possible to determine it, a contracted field; and, in the laboratory, cupped optic nerve, frequently the signs of an optic neuritis, chorio-cyclitis, iritis, atrophied ciliary muscle, dilated ciliary vessels, a degenerated vitreous body, and an opaque lens.

Another atypical group is constituted by cases:—(a) of perforated cornea from corneal ulcer, or, by perforating and infected wounds, leading to partial corneal staphyloma, empty anterior chamber, irido-cyclitis, increased tension, and loss of vision. In the laboratory, cupped optic nerve, inflamed and swollen, turgid, or atrophic ciliary muscle, dilated ciliary vessels, degenerated vitreous, and opalescent or opaque lens.

Approaching the usually regarded typical forms—that is to say, the so-called primary glaucoma—our minds at once revert to their usual grouping:

(*a*) Glaucoma simplex, or the so-called non-inflammatory type, regarding the nature of which there has been so much discussion.

(*b*) The subacute inflammatory type, beginning with transient impairment of vision, recurring attacks increasing in severity and with briefer intervals between the exacerbations, the inflammatory features and pain meanwhile growing more pronounced; the anterior chamber shallow, the cornea steamy, the iris atrophic; the impairment of vision, the contraction of the field, and increased tension; at first transient, but becoming permanent. The anterior perforating vessels (long anterior ciliaries) becoming permanently engorged; from the first the transient attacks being associated with impaired range of accommodation. If neglected, total blindness ensues and the disease passes into a stage of absolute glaucoma. In the laboratory is found deeply cupped, atrophic optic nerve, atrophic ciliary muscle with evidence of preceding inflammation, dilated ciliary vessels, degenerated vitreous body, opaque lens; invariably both eyes in near sequence are involved.

(*c*) The acute inflammatory type, more violent from the onset, the final result as set forth in the former group rapidly consummated and the same laboratory findings in more exaggerated form.

(*d*) The so-called hæmorrhagic glaucoma, constituting one of the most striking and hopeless forms of disease with which the ophthalmic surgeon meets.

General Consideration.

We have in this summary eight well-defined groups, differing widely in their clinical history, but nevertheless drawn into one common group, characterized by increased tension of the eyeball and its disastrous sequelæ, and by certain pathological findings in the laboratory more or less common to them all.

What relation, if any, do they sustain each to the other?

Is there some ætiologic factor, more or less common to them all, to which the increased tension is secondary?

In discussing these questions, there are certain general considerations which cannot be evaded. If we take, for example, the buphthalmic child with its destructive uveal disease, beginning before birth or during infancy or early childhood, we find that it is obviously dependent upon, or constitutes a part of, some general, usually hereditary, disease. I have published a striking example of the latter under the caption of prenatal iritis in a syphilitic child, in which the buphthalmos occurred and the child passed into imbecility, the victim of syphilitic endarteritis (*Ophthalmology*, July, 1908).

In the secondary increase of tension in serous iritis and also in iritis of the plastic type, I have many times had the opportunity to witness the onset of the iritis while the patient was under treatment for uveal disease, and the underlying systemic affections of which the ocular disease was but one of the local manifestations.

In practically all cases of idiopathic iritis, if seen sufficiently early, when an ophthalmoscopic examination of the fundus oculi is still possible, careful study will reveal a fluffy eye-ground, dark, homogeneous, red in colour, full vessels with all details veiled or obscured by infiltration or œdema. As the disease advances to the ciliary region and iris, the anterior part of the vitreous and the aqueous become cloudy with infiltrate and the ciliary vessels deeply engorged. The increase of tension in the globe by no means always waits upon the annular synechiæ to exclude the anterior chamber, the formation of *iris bombé* and the closure of the angle of the anterior chamber. The increased secretion from the inflamed uvea, colloidal in character, has already overloaded the pectinate screen at the angle of the anterior chamber and the canal of Schlemm, and caused pathological changes in the region of the *ora serrata* and the *venæ vorticosæ*, so that drainage is delayed or rendered impossible and tension of the ball increases. The excruciating pain is one of the evidences of this increase of tension.

What is the nature of the disease which has fallen with such disastrous consequences upon the eye?

The day has long since passed when idiopathic iritis in any of its forms was regarded in any other light than as a local expression of a variety of systemic affections, *e.g.*, syphilis, "rheumatism"—whatever that may mean—in some of its chronic forms, gout, tuberculosis, and other infections and toxæmias, either endogenous or exogenous in origin.

Neglecting for the present the so-called simple glaucoma, I pass to consider the inflammatory types.

Here, again, the ophthalmoscopic study is important. In my early experience I was so intent upon the study of the optic nerve and retinal arteries for a possible cupping of the former, and the presence of the arterial pulse, that other things were doubtless overlooked, but not so of late years. The posterior pole of the fundus may be relatively normal in appearance, while the periphery of the ophthalmoscopic field is fluffy and veiled; a fact which may account, as Fergus has pointed out in choroidal affections, for certain limitations of the field of vision, which in examples of increased tension we are prone to ascribe solely to the condition of the nerve as the result of pressure. Then, too, the failure of the accommodation in the early stage of the glaucomatous process, points decidedly to disease in the ciliary region, involving the contracting power of the ciliary muscle, and possibly to some pathological interference with the suspensory ligament, bathed, as it must be, in the products of inflammation. The early transient attacks are not infrequently associated with halos around the flame, even when there is no demonstrable steaminess of the cornea. I have frequently been able with a +12 D. sph. lens and a strong light to detect with the opthalmoscope a fine granular infiltrate back of the lens, apparently occupying the space between the lens and the anterior border layer of the vitreous body, whither it had probably proceded from the inflamed ciliary region through the complex fibrillated structure constituting the suspensory ligament of the lens.

But what is the ætiologic factor behind the ciliary inflammation? Primary glaucoma, so-called, has long been recognized as a disease prone to attack individuals who are approaching or have passed the meridian of life. The occurrence of primary glaucoma prior to this period is certainly relatively rare. It is therefore a disease coming on at an age when the wear and tear, the harassing vicissitudes, the misfortunes, the exposures, the overwork, and vicious living have sapped the physiologic foundations of life; when infections have found entrance to the structure of the organism through the doorway of the epithelium; and a variety of toxic, auto-intoxic, and other influences have set up vascular and cardio-vascular disease and the associated nephritis, uveitis, high blood pressures, etc., etc. Glaucoma, in fact, rarely occurs in individuals in good general health. In advanced age and in advanced stages of general vascular disease or in the presence of some general dyscrasia, in what organ of the body, reasoning *a priori*, should we be more likely to find local expression than in the uveal tract of the eye, *e.g.*, general uveitis, retinal hæmorrhages, hæmorrhagic glaucoma? Have we analogies? Do we find by way of illustration analogous conditions elsewhere in the body? Do other organs besides the eye suffer disaster because of the changed constitution of their nutritive fluids? Do other organs, *e.g.*, the brain, the kidneys, the serous cavities or the mucous-lined sinuses in the anterior segment of the skull, the ductless glands, execute their functions normally and remain in perfect health in the presence of blood and lymph streams loaded with the toxic products of an impaired or faulty metabolism? Clinical experience compels a negative answer. How, then, can we expect that the highly vascular uvea should escape the disasters which befall the other organs of the body in the presence of impaired metabolism, hereditary disease, and acquired infections and toxæmias? In certain toxic conditions characterized by an acidosis of the tissues the mucous membranes become engorged and œdematous. If those lining the turbinals in the attic of the nostrils are involved, together with the membranes lining the accessory sinuses, we have impaired drainage, stuffed cavities, increased pressure, and pain.

In chronic rheumatic or gouty subjects, the swollen and painful joints, following exposure and indiscretions in diet, giving rise to toxic or other states of the blood, afford an analogous condition of pressure and pain. Uræmic coma affords a striking example of intra-cranial œdema and pressure.

In the eyeball, while the pathologic states are probably more or less closely analogous to those affecting other organs, the complex and extremely delicate anatomical mechanism by which its functions are performed introduces other factors. The drainage and filtration system of the eye, although sufficient in health, may not be adequate if the fluids to be drained into the lymph spaces surrounding the eye are changed in their quality by disease of the tissues which secrete them; or the filtering tissues themselves may suffer injury and their functions become impaired by contact with tissue juices changed in character. By way of illustration of what may occur as the sequelæ of inflammation of the choroid and ciliary region, we have but to recall the filtration into the vitreous body in cyclitis. The infiltrate may often be resolved by a convex glass behind the ophthalmoscopic mirror into a fine granular web, apparently near the posterior capsule of the lens. Why has this filtrate not been carried forward into the anterior chamber? Is it because the secretion, in consequence of its changed character, can no longer pass through the fine fibrillary structure we know as the suspensory ligament and zonule of Zinn. Or, has this structure itself been injured by the inflamed ciliary muscle and contiguous tissues from which it springs? In either case may we not find here a sufficient explanation in the accumulation of fluids behind the zonule, for the pressing forward of the lens, resulting in a shallow anterior chamber, a partial or complete closing of its angle by the periphery of the iris, which, because of its participation in the uveal inflammation, becomes firmly glued to the cornea at the angle or dragged backward by the atrophic and contracting ciliary body and ciliary muscle?

In such reasoning we may find a possible or even a probable picture of the pathological history, and also an explanation for the clinical course pursued by not only the atypical forms of increased tension of the globe but also for the clinical picture of inflammatory glaucoma.

But you ask, why do not all cases of uveal disease result in pathological tension of the eyeball? I can only answer, I do not know. But we do know that hypermetropic eyes are more prone to suffer increased tension than myopic; that eyes with a thick, rigid sclera, presumably more unyielding, are also prone to glaucoma. In this connection I call attention to a well-known clinical fact, namely, the increased refraction in eyes after a severe attack of irido-choroiditis. I have many times seen a hypermetropia diminish or an actual myopia develop without swelling or demonstrable displacement of the lens; therefore presumably due to an axial change in the ball. The thin or yielding sclera has distended under intraocular tension. Had the sclera been less yielding under intraocular pressure, it is conceivable that glaucoma would have resulted instead of distension of the globe. In this reasoning we may find another explanation for the rarity of glaucoma, as well as for the tendency to myopia in early life.

Again, you ask, how are we to explain glaucoma simplex, *i.e.*, the so-called non-inflammatory glancoma?

In reply I turn for study to a large clinical experience; I have under my care at the present time three fairly illustrative examples:

One of these patients, a large, sturdy man aged 58, had for many months been under different ophthalmic surgeons, each of whom had advised the persistent instillation of eserine or pilocarpin. At no time (if his statement can be accepted as true) had there been pain or redness of the eyes. When referred to my clinic at the Wills Eye Hospital, the right eye was totally blind, the eyeball hard, the iris discoloured and atrophic, the pupil dilated, the anterior chamber shallow, and the long anterior ciliary vessels engorged. The nerve was cupped, but was indistinctly seen through the cloudy media with the strong light of the electric ophthalmoscope. The eye had passed from a glaucoma simplex, or a non-inflammatory type, to an inflammatory glaucoma. I have had very many opportunities to witness this clinical picture.

The fellow eye had V. = 1/3, tension + 1, a contracted field, and a shallow but typically cupped nerve, surrounded by a yellowish halo. The fundus details were veiled somewhat, but the media were clear. The pupil was not dilated, but reacted sluggishly to light, and the iris was not discoloured. It was a fair example of glaucoma simplex.

He was admitted to the house and placed in bed. The urine was acid, had a high specific gravity, hyaline casts, a trace of albumin, and many oxalate crystals. His blood pressure was 168. The tension of the right eye was 90, the left 44. He was placed on a diet of stale bread and skimmed milk, magnesia sulphate purge, and an electric sweat bath daily. Internally he received five grains of calcium chloride every four hours and 1/100 gr. of nitro-glycerine three times daily. Under this regimen the blood pressure fell to 150, and an iridectomy was done on the blind eye. The convalescence was rapid. The tension fell to normal and the eye became white, but it recovered no vision. The vision in the left eye rose to 6/5, T. n. and the veiled fundus cleared. The man was discharged, without operation on the left, to be observed as an out-patient.

The other two now under observation are private patients :

Mrs. A., aged 57, claimed that she was in good health and had never had any serious illness. She came for advice on August 4th, 1913, and gave the following history :

She first sought advice for failing vision in the right eye December, 1911. The surgeon found a deeply-cupped nerve. She received myotics, and used them continuously until August, 1913. The vision grew steadily worse until even perception of light was lost, but at no time was there redness or pain. During the late winter of the present year the left eye began to fail as the right had done, notwithstanding the fact that she had steadily used the prescribed myotic.

I found the following conditions present :

Right eye.—No perception of light, T. + 1, ciliary injection, long anterior ciliary vessels engorged, anterior chamber shallow, pupil contracted under eserin, lens nucleus strongly reflecting, no view of fundus. Right periorbital pain, variable in severity.

Left eye.—White, long anterior ciliary vessels full, T. n., anterior chamber normal depth, iris apparently healthy, pupil contracted under eserine, no pain, V.=6/6 but fails before line of letters is completed. Field of vision shows a nearly concentric contraction to 20°. She was admitted to private hospital for general study, and the eserine was omitted.

The urine had a specific gravity of 1,028 with trace of albumin and a few hyaline casts, no sugar but trace of indican, Blood pressure was 195 mm. in systole ; no serious heart lesion. She was placed in bed on stale bread and skimmed milk diet, sulphate of magnesium purge on alternate days, gr. v of calcium chloride every four hours, and 1/100 gr. of nitro-glycerine three times daily. By the 8th of August, when the specific gravity of the urine had fallen to 1·017, the blood pressure to 170 mm. in systole, I did a cautious peripheral iridectomy on the right eye under ether anæsthesia. The operation was smooth and was not followed by any reaction, but the anterior chamber remained empty until the 11th, three days after the operation. The eyeball was soft, free from tenderness or pain, and the general blood pressure had fallen to 156 mm. On the 14th the anterior chamber was formed, T. n., eye nearly white. During these days the left eye showed a doubtfully increased tension, the eserine being omitted.

The ophthalmoscope showed transparent media, and a typical glaucomatous cup, but the details of the fundus were veiled. The eye was white and externally apparently healthy. Ether was administered, and a peripheral iridectomy made on the left eye. The operation and convalesence were uneventful. On the 17th, eye white, anterior chamber restored, wound smooth, blood pressure 140 mm. She was allowed to return to her home on the 22nd. V. (with correcting glass) = 6/7 1/2, T. n, and field of vision for form approximately normal. The general regimen and treatment have been continued.

This also was an undoubted case of glaucoma simplex, which in the right eye had passed into subacute inflammatory glaucoma after blindness had resulted, and was associated with a general toxæmia, probably intestinal.

The following history is one of signal interest.—The patient is a personal friend. Her mother, aged 84, had been under my care for recurrent iritis resulting in secondary glaucoma but without annular synechia, although there were several slender attachments of the iris to the lens capsule. The daughter consulted me for asthenopia and received correcting glasses for hypermetropic astigmatism, which gave normal acuity of vision in each eye in 1896, she then being aged 40. She was the mother of two healthy daughters, both of whom had high errors of refraction. One daughter passed, while under observation, from hypermetropic astigmatism, into mixed astigmatism, and finally into myopia through the turnstile of astigmatism, *i.e.*, from distension of the sclera. Mrs. X wore her glasses comfortably, receiving changes to meet her increasing presbyopia until 1904, eight years. She then presented some condition which is not noted, but led me to place in the record "advised to keep eyes under close observation." Notwithstanding this advice, she did not come again, although her children were more or less constantly at the office, until 1907. She had had no pain, the eyes had not been red or troublesome in any way, but the occasion of her visit led to the accidental discovery that she saw badly with her left eye. V. = 6/5 in the right, but in the left only the largest letters on the chart, and these only by eccentric fixation. There was only an island of retained vision in the temporal field and a deep, typical glaucomatous cupping of the nerve, which was grey-green to the scleral ring, T. + 1. In the right the field was normal, but there was a commencing cup in the lower part of the nerve. T. n. The anterior ciliary vessels in the left were large, but not so in the right eye. The media were transparent. No note was made regarding the general fundus conditions.

In the meantime she had developed a lithæmic diathesis and nodules had formed on the finger joints, and she suffered pain after errors in diet, over exertion, or changes in weather, especially from a sudden fall in temperature.

A broad iridectomy was made on the left eye, resulting in normal tension, a considerable improvement in the field, and V. = 3/60 with slightly eccentric fixation. She was much alarmed lest the right eye should pursue a similar course, and before many weeks complained of transient spells of dim vision following fatigue or imprudence in diet. When her arthritis was more than usually painful, the eyeball became tender to palpation and would not bear work. At such times the field showed transient impairment, and she had occasional pulsation in the lower central artery of the retina. I did an iridectomy on the right eye on April 16th, 1907. After complete convalescence, vision with her correcting glass rose to 6/5, tension and field remained normal in the right and unchanged in the left until January 2nd, 1913. She then began to suffer marked increase in her arthritis, her hands presenting a most painful illustration of its deforming influence, some of the articulations of the fingers and thumbs being dislocated. In addition, domestic sorrow came and in its train rainbow vision, impaired fields, increased tension in both eyes, but higher in the left, periorbital pain, and great suffering from the *arthritis deformans*. In a word, a complete recurrence of glaucoma in two eyes with typical iridectomies in each, which had remained entirely well and free from tension from April, 1907, to January 2nd, 1913, six years, with V. = 6/5 in the right eye and no change in the left. The bulbar conjunctiva, which, following the iridectomy on each eye had always exhibited the evidence of free drainage, became snugly adherent to the sclera. The left eye now lost all useful vision, but the right, under the use of eserin, high frequency current, and general treatment, maintained V.=6/5, but at times showed a tendency to fail and the field to become contracted.

The sclera in both eyes became more rigid, the anterior ciliaries more engorged, and the fundus details veiled by an increasing œdema of the retina and choroid. At the same time the nostrils and accessory sinuses became stuffed by a boggy or œdematous mucus membrane. V. fell to 6/30 in R.E. and the blood pressure rose to 185 mm. The corneæ were clear, but she was greatly troubled by rainbows around the lamp or gas flame. She was then admitted to the hospital and placed on skimmed milk and stale bread, sulphate of magnesia purge, nitro-glycerine, and electric sweat baths, under which the blood pressure fell to 160 mm. A large anterior sclerotomy was made on the right eye with a cataract knife under general anæsthesia. The section was made in the same manner as in compound extraction, but farther back, opening the old scar of the former iridectomy. Bleeding was very free. Convalescence was rapid. The tension fell to normal, and two weeks later, she returned to her home with V.=6/9 and marked increase in fields and freedom from pain. In less than a week V. again fell to 6/20 with + tension.

She was then admitted to the private hospital separated from certain annoyances inseparable from her home life, where rest and quiet could be enforced, and the diet and general treatment supervised. Under the regimen adopted and electric light sweats, the blood pressure came down to 140 mm. her general health improved, she slept well, ocular tension came to normal in the right eye and was much reduced by eserin in the left. She then went to the seashore with V.=6/6 in the right eye, which has been maintained.

The history of this case has been related at some length for the reason that it is replete with suggestion as to the ætiology of glaucoma and its relation to systemic disease, even in its apparently non-inflammatory type, *i.e.*, in glaucoma simplex, of which at the outset it was an unquestioned example.

In the first place, the eyes were under observation for eight years because of an error of refraction without furnishing the remotest suggestion of a glaucomatous process. During these years, from forty to forty-eight years of age, she became the victim of an advancing rheumatic or gouty diathesis with *arthritis deformans* and with this general dyscrasia came ocular disturbance, consequent upon delayed drainage, impaired range of accommodation, rainbow circles about the gas flame ; a hazy œdematous retina, increased tension of the ball ; iridectomy. Following the performance of iridectomy, she sedulously followed a regulated diet, took alkalies and the salicylates, and retained vision of 6/5 for six years without change in the fields. Then came a chapter of domestic affliction and with it a rapid increase in her arthritis, and *pari passu*, rainbow vision, increased tension, a closure of the filtration at the site of the iridectomy, contracting fields and lowered sharpness of vision, a vitreous filtrate and œdema of the fundus, the recurrence of the process being apparently due to changes in the tissue of the globe, especially in the region of the *ora serrata*, similar to or identical with those which had occurred in the joints, closing the filtration channels in the anterior segment of the globe.

Before closing I wish to call attention once more to the laboratory findings in eyes enucleated after periods of increased tension, and especially to the atrophy of the uvea in the ciliary region and the dilatation of the blood vessels. It is obvious that the shrinking of the ciliary muscle, ciliary body, and processes would cause a contraction of these tissues and a drag backward of the root of the iris and the meshwork composing the pectinate screen at the angle of the anterior chamber, together with the blood vessels of the ciliary zone of the iris. It is the cutting free of these contracting bands of adhesion, severing the blood vessels between the most anterior border of the ciliary body and the root of the iris through a considerable sector of the circle of the iris root, which, in my judgment, results in the benefit afforded by a properly performed iridectomy. No other procedure with which I am familiar severs these pathological adhesions to the same extent as does a successful peripheral iridectomy.

In conclusion, if the suggestions of this paper are fortunately to be accepted as true, then glaucoma takes on a different if not a new meaning, and must be regarded as a convenient appellation for the ocular manifestation or expression, on the one hand, of a general or endogenous infection or toxæmia, and, on the other, of an exogenous or local infection. It follows that treatment must be addressed to the ætiologic factors and holds out the hope of prevention, and that failing in this, operation is designed to ward off temporarily the sequelæ of increased intra-ocular tension.

CLINICAL MEMORANDA.

A NEW WAY OF USING BURDON-COOPER IMAGES.

BY

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WE are indebted to Dr. Burdon-Cooper, of Bath, for the discovery, that the reflections from an incandescent lamp can be made to indicate the axis of a cylindrical lens. To give precision to the result and to locate the axis in degrees, he enclosed a lamp in a small cubical box, one side of which contained a rotating disc, with a slit across one diameter, so as to obtain a rotating line of light. This box was mounted at one end of a board, the other end of which either supported the pair of lenses to be tested, or else allowed the patient's own face to be so placed as to let the lenses have their axes determined actually as worn. This was a great advance, and the "optical aximeter" would doubtless have come into general use some years ago, but for the unfortunate limitation that it could not be used for toric lenses, which are becoming more and more general.*

Regretting this limitation of so valuable an invention, I experimented with reflections from glass and metal rods and white knitting pins. I find that the difficulty with torics can be entirely overcome by this means, since the only requisites are to be able to choose for each lens an appropriate distance of the object, and that the latter should be thin enough to allow the eye of the observer to be approximately in line with the object and image. The only drawback, therefore, to the "optical aximeter" was its fixed distance.

To examine a single lens, as from the trial case, or a spectacle lens, we need only hold it against a dark background and in comparative shade, while the knitting pin or whitened hat pin is allowed to have the light falling full upon it. The distance at which to hold the rod is very speedily found, since it is that which enables us to see the reflections from the two surfaces of the lens as equally clearly as possible. When they are parallel, the axis is also parallel to them, and to the pin which produces them, or else at 90° therefrom. To determine the inclination of the axis in degrees, I merely fixed a white knitting pin between the tops of two pillars on a new pattern of my cylinder axis finder, made for me by Botwright and Grey, and exhibited at Oxford in the year 1912.

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* The apparatus was made Messrs. Dixey, of Bond Street and Welbeck Street, W., and a description published in THE OPHTHALMOSCOPE for 1910.

In a still later pattern, made by an instrument maker in Bournemouth (Mr. Holloway), a vertical position was given by him to the reflecting rod, to enable the degrees to be read off more conveniently.

Even without any apparatus, however, a thin white rod, such as can be conveniently carried in the waistcoat pocket, will be found very handy for acertaining whether an axis supposed to be vertical or horizontal is really so, since it is easy to hold the rod upright or horizontal and note whether its two images are parallel or not. If they lie at an angle, the tilting of the rod required to restore their parallelism gives a very good idea of the amount of error. For all such tests a black or sombre background is very helpful. A little velvet fixed to a strip of cardboard can be slipped behind the lens. When the trial frame contains both a sphere and a cylinder, the former should be extracted from its cell before testing the cylinder, for though its reflections in no way vitiate the test, they are embarrassing.

Used in these simple ways, I cannot but think that the Burdon-Cooper images will come into much more extended use.

A CASE OF BILATERAL ANNULAR TRACHOMATOUS PANNUS.*

BY

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THE features of the case detailed below are worthy of publication because of the remarkably close clinical resemblance to the picture of vernal catarrh, and also because of the infrequent occurrence of an annular pannus in trachomatous infection.

Case.

Patient, *æt.* about 6 years, male. Two months before attending the clinic, the boy's mother observed that his right eye was injected. The child did not complain of any pain or itching, but was troubled by bright lights and displayed the usual manifestations of photophobia, had some lacrymation, and a certain amount of discharge of creamy pus. The onset in the right eye was followed in a few days by involvement of the left, with similar symptoms and signs.

History.—No previous ocular maladies.

Family History.—Both parents are trachomatous, the mother in a stage of trachoma ii, with a tendency to trichiasis, and the father in stage iii. No history of brothers or sisters being similarly affected—important in connection with both trachoma and vernal catarrh, Meyerhof having demonstrated a certain tendency to family history in the latter affection.

Previous Treatment.—A few days after the parents noticed the discharge, the lad was treated by Dr. Gamaleddin at his private clinic, a successful operation for trichiasis being performed. Drug therapy was of brief duration.

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*The case was demonstrated at the annual meeting of the Ophthalmological Society of Egypt, 1913, by Mr. McCallan and Dr. Gamalleddin.

Condition on Admission to No. 1 Travelling Ophthalmic Hospital.—Well nourished, healthy boy, with some degree of mechanical ptosis, and the usual accompaniments of an acute conjunctivitis: photophobia, lacrymation, and discharge. The latter is not profuse, is rather tough, thick, and yellow, small beads of muco-pus collecting at the inner canthus. Both eyes are obviously involved.

Right Eye.—There is some congestion of the conjunctiva bulbi, and two reniform or crescentic aggregations of infiltration are present midway between the limbus and each canthus, the concave margin being directed towards the limbus. The areas are œdematous, pinkish, gelatinous, and raised 1-1.5 mm. above the general conjunctival surface. Each mass is 4-5 mm in vertical length and 1 mm. in horizontal breadth. The conjunctiva tarsi is in the granular or follicular stage of trachoma, which is usually associated with some discharge. Extending completely around the limbus is a raised, œdematous, pannoid growth, extending uniformly on to the cornea for a distance of some 3 mm., but leaving a central zone of clear cornea, 3 mm. in diameter. The colour and general appearance of this is almost identical with the purely conjunctival masses detailed above, and the colour can be ascribed to the very abundant vascularisation, which can be seen to arise from conjunctival vascular radicles. The mass is rather more redundant over the upper third of the cornea, where it is raised fully 1.5 mm. above the normal plane. The inner edge of the ring appears more or less uniform to the naked eye, but the Zeiss *loupe* demonstrates a serration or dentation. The external margin tapers off somewhat gently into the conjunctiva bulbi. Immediately adjoining the inner border, the cornea is slightly infiltrated and grey. The pupil is active, there being no evidence of iritis. Ophthalmoscopic examination gives negative findings. T.n. Vision, 6/60.

Left Eye.—Presents a precisely similar appearance, except that the condition is not so pronounced. The ring of pannus is considerably narrower below, 1 mm., and not so elevated over any portion of its extent. Vascularisation is very free, both in the epibulbar masses and in the pannus. Trachoma is present. Iris and fundus negative. T. n. Vision, 6/24.

Pathological Examination.

Smears prepared from the conjunctiva tarsi and from the pannus were stained with Giemsa or Jenner. Some Koch-Weeks' bacilli were found. Of the cellular elements, large mononuclear cells were the predominating feature, constituting by far the most numerous type; small mononuclears were next in abundance; polynuclears scantier; mast cells here and there; and eosinophiles only two or three in all the slides examined: epithelial cells were in plenty. The so-called "trachoma bodies" were readily identified and were present in relatively large numbers, as many as ten being seen in a single slide. All of those recognised were intracellular and associated with an epithelial cell.

The progress of the case was so good that excision of a portion of the pannoid mass was not considered justifiable.

Course.

The conjunctiva was curetted and painted daily with perchloride of mercury, 1 per cent., and in the course of a fortnight the left pannus had resorbed almost to the general corneal plane, the right eye showing less marked improvement. In another fortnight the conjunctiva bulbi was almost normal, the conjunctiva tarsi in the stage trachoma iii (early and incomplete cicatrisation, of lattice-work pattern, with smooth conjunctiva), and a few weeks later, the pannus was flat and reduced to the general corneal plane

Further progress could not be noted as the patient ceased attending the clinic.

Remarks.

Clinically the case at first appears to be one of tarsal trachoma associated with limbal or corneal vernal catarrh, the pannus having an appearance particularly suggestive of the latter condition, the peculiar mother-of-pearl sheen being very pronounced. The onset was in December and the patient did not present till late February, when the case was at its apogee. The smears, however, absolutely exclude vernal catarrh, and together with the favourable course under treatment, leave not the slightest doubt as to the purely trachomatous nature—the bacillary infection being negligible in so far as the pannus is concerned. The features of particular interest in this case are: the annular form assumed by the pannus, the involvement of the conjunctiva bulbi in what was doubtless a trachomatous infection, the bilaterality, the acute nature, and, lastly, the favourable course under appropriate therapy. Under the MacCallan nomenclature trachoma ii is the acute stage, embracing the follicular and papillary types of the older, very unsatisfactory, and inadequate classification. This patient was an instance of trachoma ii, one of virulent infection with the trachoma virus, involving, as it did, infection of the conjunctiva, both tarsal and bulbar, and the superficial tissues of the cornea, the layer corresponding morphologically to the conjunctiva.

TRANSLATION.

THE CAMPAIGN AGAINST TRACHOMA IN HUNGARY.[*]

BY

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SYSTEMATIC measures against trachoma were first taken by the authorities in Hungary thirty years ago.

The legal basis for the regulations made by the authorities is contained in Law Article XIV of the year 1876, on the organisation of provisions for the preservation of public health, which orders the reporting of infectious disease, isolation of the patients, and, if necessary, compulsory medical treatment and erection of hospitals. But while no paragraph of the said Article, treating of epidemics, provided adequately against trachoma—which in several districts for some years had become a source of permanent danger—the legislature passed Law Article V of the year 1886, which deals exclusively with the prevention of the spread of the disease. The chief provisions of the last-named Article are: (1) the expenses of treatment in hospital of every destitute patient—or of treatment at home, if ordered by the authorities—are to be borne by the State; (2) in districts where the disease is found to be more prevalent, oculists are to be sent out, whose duty it is to certify the existence of the disease, to organise the medical treatment in the neighbourhoods, to deal with the worst cases personally during this time, and also to instruct in therapeutics the local physicians who are not quite familiar with the treatment of the disease; (3) temporary eye hospitals may be put up in infected localities; (4) the Minister of the Interior is empowered to provide courses of instruction, for the benefit of local and official physicians, in the pathology and therapeutics of trachoma, to grant material assistance to such as take part in the courses, as well as to give remuneration to the local physicians; (5) the expenses of all these provisions to be borne by the State.

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[*] *Deutsche med. Wochenschrift*, 1912.

During the twenty years of the system inaugurated and organised by Feuer in its original form, considerable success was achieved. It is true that the number of published cases of trachoma is increasing rather than diminishing, notwithstanding that all the above provisions are carried out. But this fact is capable of explanation, as follows: general examinations of the eyes *gradatim* are made year by year now more strictly than formerly, with the result that many long-existing but hitherto unknown cases of trachoma have been discovered—regular hotbeds of the disease; while, on the other hand, hitherto the cured patients have not been struck off the list by the authorities, who desired to exercise control, and by this means it was impossible that the number of registered cases should show any decrease. However, the examinations of the eyes made in the schools of infected districts, as well as the general eye examinations made in the three divisions of Torontál county thrice within the last twenty years, have established the fact that all the cases brought have been successfully treated.

A similar improvement is noticed with regard to the severity of the disease, in so far as pannus or lid complications are becoming more rare. Yet doubtless new cases will be constantly cropping up, which are chiefly attributable to the social conditions of the districts infected with trachoma.

Feuer died in the autumn of 1902, and the then Premier did not appoint any one to succeed him in the post of sanitary inspector; but on the proposal of the Sanitary Department, he appointed a University Professor of Ophthalmology to be Government Commissioner for trachoma affairs. Since 1906 the trachoma inspector has been Dr. Cornelius Scholtz, *Privat-dozent*, ministerial reporter, and formerly assistant at the University Eye Hospital, a specialist of the first rank.

I considered it the first duty of my office to study the conditions on the spot, both in Hungary and abroad, and it was only after such study that I published my programme, the concluding paragraphs of which were as follows:

I. It is necessary to keep touch of all genuine trachoma patients. This purpose is served by (1) the obligation to notify cases, (2) eye examinations in schools, factories, lodging-houses, and of paupers, servants, returned soldiers, and recruits, (3) general eye examinations of the inhabitants, but only exceptionally by order of the central authority.

II. Gratuitous dispensary treatment of trachoma patients should be given by local physicians—official or private practitioners who may be competent. The employment of special trachoma physicians for this purpose should take place in exceptional cases only. A fixed fee should be paid to each physician engaged, calculated on the basis of his professional experience and attainments. The treatment should be given with the assistance and under the control of oculists of the district who are at the same time directors of the district eye hospitals of about 50 beds. The united administration devolves upon the centre; the superintendence and the instruction take place in the trachoma department of the University Eye Hospital, where a separate college for trachoma and courses for practitioners are provided.

III. Improvement of the hygienic conditions of schools and workmen's dwellings, the establishment of industrial colonies in trachoma-infected neighbourhoods for the prevention of straying, the maintenance of those families whose heads are sent to the hospital in the public interest, or prevented from following their employment---these are important duties of the State. Recruits suffering from curable trachoma should be sent to the ophthalmological department of the military hospitals, whence, when cured, they would be returned to their regiments, while those not cured after a period of four months' detention, might be granted furlough, if their malady has lost its infective character.

IV. For the perfection of the pathology and therapeutics of trachoma on a scientific basis, prizes should be offered for treatises on the subject; while for the popular enlightenment, brief and simple instructions should be published.

The realisation of the above-described programme is about to take place. On the 20th January, 1904, the Minister of the Interior promulgated a Circular Order which, rendering obsolete all the orders issued during the past twenty years, simplifies the whole service and facilitates its carrying out.

The first paragraph of the order fixes the duty of reporting cases of trachoma, registration, and periodical examination of the eyes of the patients. The second provides for preventive measures to be taken in the case of school-children, workmen, soldiers, and railway employés. The third deals with the treatment. As sufferers from trachoma, owing to the infective nature of the disease, endanger the health of others, they are compelled, in accordance with Section 82 of Law Article XIV of 1876, to seek medical advice. On the other hand, it is the duty of the authorities to provide gratuitous dispensary treatment for affected persons, either in their own locality or in the immediate neighbourhood. Such persons only as need attention for a prolonged period are to be admitted to a hospital. The order places the responsibility for the dispensary treatment in the hands of physicians residing on the spot, and in exceptional cases only in those of trachoma specialists. Consequently, the number of these latter becomes fewer, while, on the other hand, the number increases of local and district physicians who receive a fixed fee or remuneration from the State. In order to perfect their knowledge, courses of instruction on trachoma are already given in the University Eye Hospital; physicians attending the same receive from the State living allowances and travelling expenses. Annexed to the order referred to is a simple dissertation on trachoma, to be printed and distributed widely.

In compliance with my recommendation, the Minister of the Interior has announced a prize of 2,000 crowns for the best work on the pathology and therapeutics of trachoma. The first half of the prize has been already won by Professor Kuhnt, privy councillor; the second half still remains to be awarded.

The most important feature of the campaign against trachoma is the establishment of provincial eye hospitals and ophthalmological departments at the general hospitals under the direction of specialists. Thus, the eye hospital at Brassó has been renovated, enlarged, and the number of its beds increased to 90; the trachoma hospital at Szeged has been transformed into an eye hospital with 100 beds; a hospital with 60 beds has been built at Perlak; and at Budapest a State eye hospital with 110 beds has been provided. Another very important feature of the campaign are the two new University Eye Hospitals at Budapest and the one at Kolozsvár; the total number of beds at all three being 222. In different hospitals ophthalmological departments have been provided with altogether 647 beds, so that, reckoning the beds of the trachoma hospitals already in existence, there are 1,200 beds at the disposal of persons suffering from disease of the eyes.

I consider it very important that directors of State eye hospitals should have an influence in the treatment given at local centres. The State eye hospitals should at the same time serve as intermediate stations for the central administration.

Until the network of eye hospitals is completed, oculists are, in accordance with the provisions of Article of 1886, compelled to supervise the treatment rendered at the local dispensaries, and to aid the local practitioners with counsel, etc.

In 1911, twelve physicians were appointed to administer treatment for trachoma. Ninety physicians received remuneration, and thirty-five were paid for their co-operation in the campaign against trachoma. Up to the present time, only one trachoma physician, whose activities in that special branch extend over a long period, has been commisioned to make a tour of investigation over the infected areas.

The trachoma courses have been justified in the results, and their extension and especially decentralisation are very important measures.

Inspection of schools must be more strictly enforced, for the schools are likely to be certain points of support in the campaign against trachoma, as shown by the example of Prussia.

Owing to the great importance of trachoma as regards the defensive force, representatives of the War Ministry, and of the Ministry of National Defence, as well as of the Ministry of the Interior, have set a common precedent, to be followed by both civil and military authorities. Hitherto, recruits suffering from trachoma were not allowed in the ranks, whereby the treatment of military trachoma cases was rendered exceedingly difficult.

The new Military Law contains the following points.—Men liable to military service who are afflicted with trachoma but otherwise fit for military duties and on whose eyes the disease has wrought no great changes, are to be enlisted and sent on the 1st July of the same year to a military hospital having a department for eye-diseases ; there they must remain until cured or not later than the end of December of the same year. Expenses of treatment from the 1st July till 30th September to be paid from the budget of the Ministry of the Interior ; the further expenses—not after the 31st December—from the budget of the War Ministry.

It will thus be seen that a systematic war against trachoma is being waged in Hungary. For this purpose the sum of 140,000 crowns has been voted by the State, to which must be added the amount of the fees paid by trachoma patients, as well as considerable local donations. But owing to the great intercourse between the inhabitants of different nations, the necessity arises of making the campaign against trachoma a matter for international conferences and agreements. Especially do the emigration to and immigration from America, and the movements of the working classes from one land to another, require an international understanding.

CURRENT LITERATURE.

NOTE.—Communications of which the titles only are given either contain nothing new or else do not lend themselves to abstract.

I.—ANAPHYLAXIS.

(1) **Roemer and Gebb.—On the anaphylaxis question. (Zur Anaphylaxie-Frage.)** *Bericht der Ophthalmologischen Gesellschaft*, Heidelberg, 1911.

(2) **Morax, V. — The relations of anaphylaxis to ophthalmology. (L'anaphylaxie: ses rapports avec l'ophtalmologie.)** *Transactions of the XVIIth International Congress of Medicine, London*, 1913, *Section IX, Ophthalmology*, p. 219.

(3) **Cramer, E.—The question of the anaphylactic origin of sympathetic inflammation. (Zur Frage der anaphylaktischen Entstehung der sympathischen Entzündung.)** *Klin. Monatsbl. f. Augenheilkunde*, August, 1913.

(1) **Roemer** and **Gebb**, of Greifswald, after experimenting on nearly 1000 guinea-pigs, and taking over 3000 temperatures, have utterly failed to produce the phenomena of anaphylaxis by injections into guinea-pigs of their own lenses, that is homologous lens substance, although it was easily produced when foreign lenses were employed. This result contradicts those obtained by Krusius and Uhlenhuth. The same result was obtained with kidney and liver tissue. The experiments confirm the theory that the body of an animal cannot be sensitised with its own albumen: as Ehrlich says, there is a *horror autotoxicus*.

T. HARRISON BUTLER.

(2) **Morax**, of Paris, gives a condensed account of the investigations previously recorded with regard to the relations of anaphylaxis to ophthalmology, together with an account of a series of experiments which he carried out in conjunction with M. Bollack at the Institut Pasteur with a view to enabling him to appreciate more exactly the results of other authorities. This will repay careful perusal in the original, since it is impossible in an abstract to do more than to indicate roughly the points considered and the conclusions drawn.

Anaphylaxis is the term invented by Professor Ch. Richet to designate a special property of the organism, discovered by him, which consists in a peculiar spontaneous or acquired sensibility of the organism towards substances borrowed from animal tissues. It is a reaction to foreign albuminoid substances, and as such should not be regarded as the opposite of immunity, which is a property by which the organism escapes from the injurious action of certain parasites or their products.

Anaphylaxis may be general or local. The former is best studied experimentally in the guinea-pig and the dog, and the latter in the rabbit. To produce general anaphylaxis, a sensitising parenteral injection (*i.e.*, an injection which reaches the tissues without passing through the stomach or intestines) of albumin is given. This is followed, after an interval of at least twelve days, by a freeing (*déchainante*) injection. According to the strength of the injections, this may be followed by symptoms of severity varying from anaphylactic shock with clonic spasm and death in a few minutes to bristling of the hair, acceleration of respiration, and reduction of temperature from 1° C. to 5° C. most marked from 1 to 1½ hours after the injection and disappearing in from 1½ to 2 hours. To produce local anaphylaxis, 5 c.cm. of horse-serum are injected every six days under the skin of a rabbit. After the fifth injection, the absorption of the fluid becomes slower, and after the sixth, a thick whitish aseptic exudate forms locally which persists for several weeks, while after the seventh, a typical eschar forms. Similar results are obtained if the earlier injections are given abdominally and the later ones subcutaneously.

The investigation of the relation of these facts to ophthalmology involves the discussion of the following points:

1. (*a*) Can an animal be sensitised by injections of serum in the different parts of the visual apparatus. (*b*) Can an animal be sensitised by injections of albumins obtained from the tissues of the visual apparatus.

2. (*a*) Can a freeing injection in the visual apparatus be followed by symptoms of anaphylaxis. (*b*) Are there symptoms of local anaphylaxis which can be studied in the eye.

3. Can any ocular diseases, especially sympathetic ophthalmia, parenchymatous keratitis, or certain sequelæ of operations on the lens, be explained as due to anaphylaxis.

The author does not discuss the debateable question of the nature of the anaphylactic phenomena, nor does he deal with alkaloidal anaphylaxis or hypersensibility to toxines (*e.g.*, the tuberculin reaction), as their anaphylactic nature is, to say the least of it, doubtful.

1. (*a*) As it has been proved that substances introduced into the anterior chamber and the vitreous, under the conjunctiva, and into the orbit, are absorbed, it was to be expected that animals could be sensitised by injections in these regions, and the experiments of Krusius and Kümmell have shown that this is the case, although the symptoms are less marked than when the injection is subcutaneous. (*b*) Uhlenhuth, experimenting on the production of precipitating serums, found that injections of ox lenses in rabbits gave rise to a serum which precipitated *in vitro* the lental albumin of humans, pigs, dogs, frogs, etc., *i.e.*, was specific for the organ not the species, and Römer's experiments on the deviation of the complement confirmed his results. Following up this line of investigation, Andrejew (under Uhlenhuth's direction) conducted experiments on the production of anaphylaxis with lental albumin, and obtained the following results: (1) In guinea-pigs sensitised wih lental albumin of pigs, oxen, or asses, freeing injections in the peritoneal cavity or heart of (α) lental albumin of the same species caused severe symptoms of general anaphylaxis fairly regularly. (β) lental albumin of another species caused anaphylactic symptoms but with much less regularity than injections of serum. (γ) serum of the species which furnished the lental albumin did not cause anaphylactic symptoms. (δ) guinea-pigs' lental substance caused definite anaphylaxis. This last phenomenon, which is known as "autoanaphylaxis," has given rise to numerous discussions. As a result of his investigations, Andrejew concluded that it is not possible by means of the anaphylactic reactions to differentiate the lental albumin of different species of animals. Uhlenhuth and Haendel found that guinea-pigs could be rendered sensitive to the lental albumin of guinea-pigs, by injections of the lental albumin of guinea-pigs, while Krusius obtained slight sensitisation in a guinea-pig to guinea-pig's lental substance by implantation of a guinea-pig's lens in its vitreous and discussion of its own lenses. These results have been checked by Römer and Gebb, Kapsenberg, and Morax and Bollack.

Römer and Gebb found :—

Sensitising injection.	Site.	Freeing injection.	Site.	Result.
Lental albumin of		Lental albumin of		
1. Guinea-pig	peritoneum	guinea-pig	peritoneum	no anaphylaxis
2. Guinea-pig	peritoneum	pig or ox	peritoneum	no anaphylaxis
3. Different species	peritoneum	guinea-pig	peritoneum	slight reduction of temperature in 1 animal in 6
4. Ox	peritoneum	guinea-pig	peritoneum	slight reduction of temperature in 2 animals in 6

On a similar series of experiments in which the freeing injection was made in the jugular vein there was slight reduction of temperature in several animals, but never medium or severe anaphylaxis.

Kapsenberg made the freeing injection in the bared vein and used measured quantities never exceeding 5 c.cm. He got the following results :

Sensitising injection	Site.	Freeing injection.	Site	Result.
Lental albumin of		Lental albumin of		
Pig	subcutaneous	pig	vein	anaphylaxis, death
Guinea-pig	subcutaneous	guinea-pig	vein	no anaphylaxis
Guinea-pig	subcutaneous	guinea-pig	vein	occasional death from anaphylaxis
Rabbit, pig, man	subcutaneous	similar to sensitising injection	vein	death 5 times in 9

The conclusion to be drawn from these experiments is, that the guinea-pig (the animal of choice for such reactions) presents under certain conditions a relative sensibility to its own lental substance, but only when a big second injection is given, which, contrary to the usual rule, must be larger than the sensitising injection. Experiments have also shown that injections of emulsion of the lenses of horses in guinea-pigs sensitised with horse's serum, or injections of serum in guinea-pigs sensitised with the lenses of species from which the serum was obtained, never causes anaphylaxis.

The entire series of experiments shows that the anaphylactic reaction is just as clear and indisputable in guinea-pigs sensitised with the lenses of other species of animals, as it is problematic when they are sensitised with the lenses of their own species.

Morax and Bollack, repeating these experiments, with all possible precautions, and always using the same quantity of dried lental substance for their injections, obtained the following results.—Anaphylaxis was produced with considerable regularity in animals sensitised with horse's lental albumin when the second injection was made with horse's lental albumin, while the results were similar but less regular when the injections were made with the lental albumin of sheep or oxen. On the contrary, injections of guinea-pig's lental substance never produced anaphylaxis in guinea-pigs, and the occurrence of anaphylaxis was much less regular when the first and second injections were made with the lental albumin of different species than when they were made with the lental albumin of the same species

The results obtained with the other ocular tissues may be summarised as follows.—Choroid and uveal pigment, no anaphylaxis (the choroidal albumin can with difficulty be obtained separately, and Elschnig insists on the identity of the results obtained with the two tissues); aqueous humour and vitreous, slight and inconstant anaphylaxis; optic nerve, inconclusive results; cornea, slight anaphylaxis.

The conclusions to be drawn are therefore that (*a*) animals can be sensitised by the absorption of albumin from the region of the visual apparatus, and (*b*) ocular albumin has the power of sensitising animals.

2. (*a*) The experiments of Besredka and Bollack show that injections into the anterior chamber and vitreous or beneath the conjunctiva can produce only an insignificant fall of temperature, probably owing to the small amount which can be given, but intra-orbital injections give almost as marked results as intravascular injections, probably owing to the vascularity of the orbit and its nearness to the intracranial venous sinuses.

(*b*) Wessely claims to have produced an anaphylactic keratitis in the second eye by injection of one or two drops of inactive sterile horse serum between the lamellæ of one cornea followed in fourteen days by a similar injection between the lamellæ of the other cornea, and von Szili and Arisawa claim to have produced corneal opacity with vascularisation in an eye sensitised by an intralamellar injection fourteen days previously, by means of a freeing injection in the auricular vein. These results have been confirmed by Morax and Bollack, who also injected horse and human serum into the anterior chambers of rabbits sensitised by repeated intraperitoneal and intramuscular injections of serum from a similar source, but found that the results could not be distinguished from those obtained in control animals. In this series of experiments ox serum was not used, owing to the severity of the symptoms which it produced, even in non-sensitised animals. The author concludes that there exists a local anaphylactic reaction in rabbits, but only in regard to foreign albumin, and that local auto-anaphylaxis has not yet been demonstrated.

3. (*a*) The author refers to the question of whether the risk of anaphylaxis in case of the necessity of the injection of antidiphtheritic serum for a subsequent attack of diphtheria should cause one to hesitate to inject antidiphtheritic serum for membranous conjunctivitis until a bacteriological diagnosis has been made, and gives his opinion that, in view of the necessity for prompt action, it should not. He refers to a case of local anaphylaxis occurring as a result of subconjunctival injections in a patient of Professor Stanculeanu and Madlle. Nita, and the possibility of combating such complications by Besredka's vaccine (diluted heated serum).

(*b*) Heim, of Erlangen, has suggested that there is a relationship between sympathetic ophthalmia and anaphylaxis, and Elschnig claims that he has shown—(1) that there is an absorption of antigene in the eye which can vary according to circumstances, (2) that emulsion of uvea introduced parenterally has an organic specificity and that the most active element of the uvea is probably the choroidal pigment. He assumes—(1) A uveal anaphylaxis caused by destruction of the tissues. As a result of a traumatism, the first eye is much altered and eventually infected by the ordinary infective agents or originally affected by reason of a pre-existing anomaly of the organism by a non-bacterial inflammation set up by the traumatism. The tissue destruction accompanying the inflammation causes an antigene absorption of uveal tissue and consequently hypersensibility of the uvea of the eye primarily affected and of the normal uvea of the second eye. (2) An anomaly of the organism which in consequence of the local hypersensibility of the uvea finds a point of attack and leads to an inflammation of the uvea of both eyes, which is sympathetic ophthalmia. The somatic anomaly may be organic disease or an auto-intoxication in the widest sense of the word. He contends that this theory explains the failure of excision of the exciting eye to stop a declared sympathetic inflammation, the late appearance of the disease (the reappearance of inflammation in the first eye setting up fresh anaphylaxis of the uvea), and the occurrence of the disease after non-perforating injuries or in intra-ocular sarcoma, while the period of latency of the disease would be explained by the period of latency observed in anaphylaxis. In opposition to this theory, Morax remarks that it is largely based on exceptional cases and ignores the reduction in the number of cases of sympathetic ophthalmia which has accompanied the aseptic treatment of wounds of the eye, and, further, that to establish his theory Elschnig must prove that ocular traumatism can provoke absorption of uveal albumin or pigment, which can act on the healthy uvea of the other eye in virtue of a process of sensitisation favoured by a general bad state of health, the existence of which can be recognised, in the absence of other symptoms, by indicanuria. As none of these propositions appears to Morax to be proven, he considers that Elschnig has not brought sufficient support to a theory which he proposes to substitute for more rational conceptions, the clinical consequences of which are of capital importance. (*c*) Interstitial keratitis. It has been shown by clinical, anatomical, bacteriological, and experimental investigations that this disease can be caused by syphilis, leprosy, tuberculosis, and trypanosomiasis and in the last three of these diseases it has been proved that the corneal inflammation is always associated with the presence of the infective agent in the corneal lamellæ. von Szili suggests that anaphylaxis plays a part in the causation of relapses or of the appearance of the disease after traumatism, but Morax points out that to accept this theory one must allow the causation of anaphylaxis of the cornea by the products of the animal to which the eye belongs, which has never been proved to occur.

The explanation of certain complications following operations on the lens as due to anaphylaxis is contrary to universal experience, that in the absence of infective complication the absorption of lens masses takes place in the second eye without local inflammatory reaction, even after discission of the lens of the other eye. R. J. COULTER.

(3) **Cramer**, of Kottbus, reports the case of a woman who developed sympathetic ophthalmia four months after removal of a lens which had become displaced into the anterior chamber. Accompanying the sympathetic inflammation was pronounced deafness, which, however, gradually passed off after enucleation of the exciting eye. Three months later, the hair, which had been abundant, was found to be very thin, and after two months more there was almost total baldness, and the remaining hairs of the head, armpits, etc., were quite white.

This experience inclines the author to accept the view that sympathetic ophthalmia is of anaphylactic origin. A. J. BALLANTYNE.

II.—NYSTAGMUS.

(1) **Wirths, R.—A contribution to the symptomology of paralysis of the associated movements of the eyes, with especial reference to vestibular and optical nystagmus. (Beitrag zum klinischen Bilde der associerten Blicklähmung mit besonderer Berücksichtigung des vestibulären und optischen Nystagmus.)** *Zeitschrift für Augenheilkunde*, Oktober, 1911.

(2) **Usher, C. H.—Case of congenital nystagmus with microscopical examination of eyeballs.** *Royal London Ophthalmic Hospital Reports*, Vol. XVIII, Part iii.

(3) **Fromaget, Camille, and Fromaget, Henri.—Latent nystagmus (nystagmus and strabismus). [Nystagmus latent (nystagmus et strabisme).]** *Ann. d'Oculistique*, mai, 1912.

(4) **Mangold, E., and Löwenstein, A. — Experimental unilateral nystagmus. (Ueber experimentell hervorgerufenen einseitigen Nystagmus.)** *Klin. Monatsbl. f. Augenheilkunde*, August, 1913.

(1) This paper by **Wirths**, of Königsberg, describes and discusses a case which should be of great interest to neurologists. There was paralysis of the associated movement of the eyes to the left, upwards, and downwards, with partial left-sided facial paresis. Although the intention movements to the left could not be elicited, the "reflex" movements to the left were normally executed—that is to say, although this patient was unable to look towards an object on his left side, if he was made to fix a given object and his head was turned to the right, the eyes continued to be directed towards the object. This proved conclusively that the lesion was situated above the nucleus. It has been suggested that this reflex movement has its origin from different impulses arising in the labyrinth. This question is discussed in the paper.

The patient was tested by Bárány's method, and the latter part of the paper deals with nystagmus. T. Harrison Butler.

(2) The patient, whose case is reported by **Usher,** of Aberdeen, had blue irides, fair hair, blond skin, and ametropia; there was no similar case in the family, of which a large tree is given; and there was no consanguinity in the parents. Several members on both sides were mentally affected.

Microscopic examination did not show any deficiency of pigment in the retinal pigment layer. There was no proper fovea, at the site of which were several layers of ganglion cells, although fewer than in the more peripheral parts of the macula. A. H. Payan Dawnay.

(3) **Camille** and **Henri Fromaget**, of Bordeaux, record the case of a man, aged 21, with a concomitant convergent squint of 15°, and amblyopia of the deviating (right) eye, who also suffered from a peculiar form of intermittent nystagmus. With both eyes open, his eyes were steady and his vision was 1, but on covering the right (deviating) eye, a very rapid (18 to 20 oscillations in a quarter of a minute) horizontal nystagmus appeared instantaneously in the left, and its vision fell to 0·4. On covering the left (fixing) eye a slow (5 to 6 oscillations in a quarter of minute) irregular horizontal nystagmus appeared in the right eye, the vision of which was less than 0·1. With both eyes open, the patient read fine print at 30 cm. easily, but in less than a minute nystagmus appeared, at first slow, but soon becoming rapid, and he could not

continue to read. When the patient looked as far as possible in any direction, nystagmus of a slow type appeared. The nystagmus caused objects to appear to move, and rapidly gave rise to a feeling of painful fatigue in the eyeballs. The pupillary reactions were normal, except for a tendency to hippus, and there was no sign of nervous disease.

The authors have satisfied themselves that the condition was neither hysterical nor one of voluntary nystagmus. They suggest that it is due to a defect in a supra-nuclear centre for the inhibition of nystagmus, which exists in association with the centre for the fusion of images, which tends to prevent the appearance of strabismus. The arguments in support of this theory do not lend themselves to abstraction. R. J. COULTER.

(4) **Mangold** and **Löwenstein,** of Freiburg, in the course of a series of experiments on rabbits, accidentally produced a unilateral nystagmus. They instituted another series of experiments to determine the nature of the lesion which caused this symptom. Through an opening on the left side of the head an incision was made in such a way as to divide the left cerebral peduncle. Examination of the parts after death showed a variety of lesions, but that which was common to all cases manifesting the unilateral nystagmus was division of the pes of the left cerebral peduncle. The nystagmus was right-sided, and it was usually associated with a marked deviation of the right eye. The one-sidedness of the nystagmus was not due to severance of the third nerve of the unaffected side, but seemed to depend on injury to some fibres in the peduncle assumed to have a cerebellar connection.

A. J. BALLANTYNE.

III.—NYSTAGMOGRAPHY.

(1) **Buys.—On nystagmography in man. (De la nystagmographie chez l'homme.)** *Revue Générale d'Ophtalmologie*, février, 1911.
(2) **Abrahams, Adolphe.—The analysis of nystagmus.** *Lancet*, May 31st, 1913.

(1) This article by **Buys**, of Brussels, may be roughly divided into two portions. The first portion concerns mainly the apparatus employed, namely, that of Wojatschek and that of Buys. A full description will be found in THE OPHTHALMOSCOPE for 1909, p. 808, to which the reader is referred.

The second portion of the article is a review of the literature concerning the study of nystagmus by means of graphic methods. ERNEST THOMSON.

(2) The short article by **Abrahams**, of London, on the analysis of nystagmus is an abstract of his thesis for the degree of M.D. at Cambridge. It describes his efforts to obtain a method of recording and analysing nystagmus. The method employed by him was photography by means of a cinematograph camera of the Kinora Company, one eye only being recorded. In this method a bromide paper print is prepared from the negative film. The photographs were enlarged four times, giving the picture of an eyeball 33·3 mm. from canthus to canthus. The reel was then dismantled and the 640 pictures numbered consecutively. In the analysis of the movements use was made of the image of two cross threads which had been arranged across the opening in the mask through which the eye was photographed. The extent of movement was measured by reference to the intersection of the

cross lines. The time element was ascertained by knowing the speed at which the film had been exposed by the electromotor driving it. Charts were then prepared from the measurements obtained. With regard to results in detail, these seem to have been of less importance in the author's work than the elaboration of a *technique*, the experiments being mainly performed on post-rotation nystagmus. All attempts at the photography of miners' nystagmus were unsuccessful. The oscillations in this form of nystagmus appear to be too small and too rapid for cinematography. It must be remembered that this is only an abstract of the work of Abrahams, and consequently suffers from brevity of exposition. A bibliography is given, which is presumably the complete one since there are twenty-five references dealing exclusively with the experimental methods of obtaining records.

ERNEST THOMSON.

IV.—OPERATIONS.

4.—Sclerotomy and Sclerectomy.

(1) **Teulières.—Contribution to the study of sclerectomy with or without iridectomy. (Contribution à l'étude de la sclérectomie avec ou sans iridectomie.)** *Archives d'Ophtalmologie*, mai, 1912.

(2) **Bettremieux.—Sclerectomy in irido-choroiditis. The mode of action of pericorneal scleral incisions and excisions. (La sclérectomie dans l'irido-choroidite. Mode d'action des incisions et des excisions sclérales péricornéennes.)** *La Clinique Ophtalmologique*, 10 juin, 1912.

(3) **Bettremieux.—Two cases of retinal detachment in myopes cured by simple sclerectomy, and the technique of the operation. (Deux cas de décollement rétinien myopique guéris par la sclérectomie simple. Technique de l'opération.)** *L'Ophtalmologie Provinciale*, juillet, 1912.

(4) **Wicherkiewicz.—Crossed posterior superficial sclerotomia. (La escleretomia cruzada posterior superficial.)** *Arch. de Oftal.*, July 19th, 1912.

(5) **Van Lint.—T-shaped sclerotomy. (La sclerotomy en T.)** *La Clinique Ophtalmologique*, 10 juillet, 1913.

(1) This paper by **Teulières**, of Bordeaux, is a record of the satisfactory results obtained in six patients by Lagrange's sclerectomy or sclerecto-iridectomy, as the exigencies of the cases demanded. Both eyes were operated on in each case. The importance of leaving the iris intact when possible is insisted on. All the cases were observed over a long period after the operations, and the efficiency of the fistulisation obtained by Lagrange's method was confirmed.

BERNARD CRIDLAND.

(2) **Bettremieux**, of Roubaix, believes that non-perforating sclerectomy is useful in a general way in the cases where iridectomy is sometimes of service. In fact, iridectomy may fail and yet sclerectomy succeed. He believes that iridectomy in most cases owes its efficacy to the modification made on the scleral wall. For the rest the paper is mainly taken up with the reiteration of his theory that incisions and excisions of the sclera around

the cornea are efficacious, not because the aqueous is let out, but because of changes which take place in the ocular circulation. He does not believe, if the reviewer understands the author perfectly, that very much importance is to be attached to "fistulization" or the "filtering cicatrix." This is what Bettremieux says:—"Non-perforating sclerectomy does away with the outer rigid layers of the sclera which for long have been considered an obstacle to the venous depletion of the eye, and replaces them by a layer of young vascularised connective tissue, It is certainly very efficacious as a remedy against blood stasis in the eye, and I doubt if there is any use in adding to it a hole in the sclerotic."

Bettremieux, then, considers that in all those eye diseases, in which blood stasis plays a principal part, there is no better operation than simple pericorneal, non-perforating sclerectomy. ERNEST THOMSON.

(3) **Bettremieux,** of Roubaix, reports two cases of retinal detachment in myopes treated by a simple sclerectomy operation. In the first case he made an attempt to excise a piece of the sclera at the lower part of the cornea, but owing to the field of operation becoming obscured by blood, he was only able to excise superficial portions of the sclera and to make a few scarifications. The result was, however, found to be very good. Soon after the operation improvement set in, vision became clearer, the retina in its lower part showed a grayish discoloration, the field of vision was a little contracted above.

From this and from other facts the author concluded that there is no need to make a fistulous opening, and that the sclerectomy need not be deep; he believes that it is sufficient to make a communication between the circumcorneal vessels, the efferent vessels of Schlemm's canal, and the conjunctival and subconjunctival vessels.

The second case was equally successful. The operation should be done as soon as possible, and the prognosis is better the more recent the detachment. General anæsthesia is unnecessary, except in children, adrenalin chloride is useful and permits of the strips being taken from the sclera in an almost bloodless field. The shaving of the sclera is taken from the lower border of the cornea. A portion of the sclera is grasped by a special forceps and sliced off with a narrow, wiry Graefe's knife; the portion removed measures 2 by 10 millimetres. The wound is recovered by the conjunctiva that was previously dissected off. The article is illustrated. P. A. HARRY.

(4) The fact that new operations are always being devised for the treatment of glaucoma, proves, says **Wicherkiewicz,** of Cracow, that the older methods are not universally successful. It is true that an iridectomy, if properly performed, gives good results in the large majority of cases of acute or subacute glaucoma; it is, however, much less uniformly successful in glaucoma simplex. The author has endeavoured to secure a yielding sclerotic by multiple superficial incisions into this membrane, arranged in two series, crossing one another, in the posterior part of the globe. The following is the *technique.*—A subconjunctival injection of novocain and adrenalin is made in the upper-outer quadrant, as far back as possible. The globe is rotated forcibly downwards, and the upper lid retracted as far as possible. A wound is made through the conjunctiva meridionally, and other incisions in the same line through subconjunctival tissue and Tenon's capsule; the edges of the wound are drawn apart, and the sclerotic is exposed. This done, adrenalin is instilled to stop the hæmorrhage, which is sometimes rather copious. Four to six parallel incisions, 10 or 12 mm. long, are then made through the superficial fibres of the sclerotic, without completely perforating this; these incisions run meridionally; following these, he makes the same number at right angles to the first. If the tension has been much increased,

one of these incisions is carried right through the sclerotic without wounding the choroid ; this last incision must not be more than 3 or 4 mm. long. The wound in the conjunctiva is then closed by several sutures ; these can close also the wound in Tenon's capsule. It is advisable to follow the operation by massage, especially if none of the incisions has been carried through the sclerotic. The tension usually falls slowly. H. GRIMSDALE.

(5) The last sentence of the article by **van Lint**, of Brussels, is to the effect that T-shaped sclerotomy in glaucoma may be performed without the necessity of admitting the theoretical views expressed by its exponent. With this somewhat naïve way of putting it one cannot help agreeing, since, while the operation itself seems quite ingenious, the author's pathological views will certainly not appeal to everyone.

The operation is something like that of Herbert; but, according to its author, easier of performance.

Starting from the horizontal meridian of the cornea, the conjunctiva is dissected up round the limbus to the opposite horizontal meridian and well off the sclera, upwards for a distance of a full centimetre. The dissection is made deeply, so as to obtain as thick a flap as possible. Two stitches are then put in position ready to draw the flap over the wound when the operation is complete. A section is then made with the keratome (*pique*) exactly as for a glaucoma iridectomy, except that the blade is introduced at 2 to 2·5 mm. from the limbus instead of at 1 to 1·5 mm. On account of the distance back at which this incision is made, the point of the knife usually tears the iris and produces an iridodialysis instead of passing in front of the iris. Sometimes (in acute or subacute glaucoma especially) a complete iridectomy is then performed ; at other times (in chronic glaucoma especially) a basal iridectomy is made, or one rests content with the iridodialysis. Since the iris is often applied to the back of the cornea, and the wound is further back than in ordinary iridectomy, van Lint frequently introduces the forceps behind the iris. For this purpose he prefers to employ a forceps the tooth of which is directed towards the concavity and not towards the convexity of the instrument. The "concentric" section and the iridectomy, if any, having been made, a pair of fine straight scissors is employed to make the vertical leg of the T, one blade is introduced at the middle point of the scleral wound and pushed towards the anterior chamber so far that when the cut is made it will extend 1 or 1·5 mm. into the corneal tissue, and so that the vertical leg of the T measures 3 to 4 mm. The already prepared conjunctival flap is now drawn over the wound, the threads knotted and cut close, and a bandage is applied for several days. The stitches are removed on the fourth or fifth day. Pilocarpine is instilled thrice daily for several weeks. The conjunctival flap retracts at the end of a week.

The operation has so far been performed upon twelve patients since the commencement of 1912. Two of these were acute cases. One of these has regained normal tension, field, and acuity. The other—a tabetic optic atrophy —has regained normal tension. All the chronic glaucomas were absolute except one. This one, from V.A 1/6 and much restricted field, obtained V.A. 1/3 and thrice the extent ot field. The tension of the eyes operated on "is almost always normal, sometimes a little higher, sometimes a little lower." Tonometric measurements were not taken regularly.

The author considers his operation superior to those of Elliot and of Lagrange, but on this subject and on that of the pathogenesis of glaucoma and the mode of action of drugs and operations we must leave him to speak for himself in the original. ERNEST THOMSON.

5.—Cataract.

(1) Vail, Derrick T.—Detailed report on 358 cataract extractions performed at Jullundur, Punjab, India, in October, 1909, at Col. Henry Smith's clinic; with complete statistical tables. *Archives of Ophthalmology*, January, 1911.

(2) Arens.—Cataract and cataract extraction in exophthalmic goitre. (Zur Kasuistik von Katarakt und Katarakt-Extraktion bei Basedow'scher Erkrankung.) *Wochenschrift f. Therapie u. Hygiene d. Auges*, 6 April, 1911.

(3) Fejér, J.—Cataract extraction from a congenital aniridic eye. (Star-Extraction an einem mit Aniridia congenita behafteten Auge.) *Centralbl. f. prak. Augenheilkunde*, November, 1911.

(4) Ewing, Arthur E.—The broad keratome in the removal of a dislocated lens. *American Journal of Ophthalmology*, October, 1911, and *Journal of Ophthalmology and Oto-Laryngology*, November, 1911.

(5) Kuhnt.—On irrigation of the capsule sac. (Ueber die Ausspülungen des Kapselsackes.) *Zeitschrift für Augenheilkunde*, Dezember, 1911.

(6) Fejér, Julius.—Cataract operations in Aniridia Congenita *Ophthalmology*, April, 1912.

(7) Obarrio.—The tolerance of the vitreous for the luxated lens, as a guide to reclination in selected cases. (La tolerancia del vitreo para el cristalino luxado, como guia para hacer la reclinacion en determinados casos.) *Anales de Oftalmologia*, June, 1912.

(8) Elliot, R. H.—The operation of couching as practised in Southern India. *Ophthalmic Review*, September, 1912.

(9) Ewing, A. E.—Abscision of the capsule with knife forceps in cataract extraction. *American Journal of Ophthalmology*, December, 1912.

(10) Liégard, H.—A modification in the method of corneal suture in cataract operations. (Une modification au procédé de suture de la cornée dans l'opération de la cataracte.) *Ann. d'Oculistique*, février, 1913.

(11) Sumner, E. W., I.M.S.—The control of the eye in cataract operations. *Ophthalmic Review*, April, 1913.

(12) Moret.—Cataract operation with conjunctival suture. (Opération de la cataracte avec suture conjonctivale.) *La Clinique Ophtalmologique*, 10 avril, 1913.

(13) Best, F.—Extraction of senile cataract with the keratome. (Die Operation des Altersstares mit Lanze.) *Klin. Monatsbl. f. Augenheilkunde*, Mai, 1913.

(14) Ram Nath Trivedi (Sub. Assistant Surgeon, Allahabad.)—Review on 422 cataracts done by "Smith's Method." *Indian Medical Gazette*, August, 1913, Vol. XLVIII, p. 311.

(1) The average age of the patients operated on by **Vail,** of Cincinnati, for cataract, at Col. Smith's clinic, was 50·3 years, but many cataracts were

immature. Only seven escapes of vitreous occurred in the whole series. The percentage of "good" vision, as estimated by the patient on leaving the hospital, on an average eight days after the operation, was 97. His remarkable success Vail attributes to Smith's method and advice.

ROSA FORD.

(2) **Arens**, of Würzburg, describes a patient of 47 years of age with senile cataract in the right eye, and congenital anterior polar in the left eye. After extraction of the senile cataract, both lids were found on the subsequent day to be very œdematous, and the conjunctiva chemotic. The operation wound could not be seen until five days later, when the swelling had subsided. Iritis did not occur, and vision when glasses were ordered was $\frac{1}{2}$. The pulse increased from 120 per minute to 150 during the operation, and the author ascribes the sudden development of œdema to the high frequency.

W. B. INGLIS POLLOCK.

(3) On account of the rarity of such conditions, **Fejér**, of Budapest, reports the case of a female patient, aged 36, who had in both eyes only the stumps of irides. Absolute absence of iris has never been found; there is always some part of the iris present, and in this case, what was present was only $\frac{1}{2}$ mm. wide. In the right lens there were some opacities, and the left had a complete cataract. The operation was performed in the ordinary manner, and the wound healed rapidly and easily, without any signs of irritation or inflammation such as are said to accompany these operations in defective eyes. The fundus appeared normal, but the best vision that could be obtained with lenses was 5/70.

A. LEVY.

(4) **Ewing**, of St. Louis, obtained a good result after removing a lens dislocated into the outer part of the anterior chamber in the following way.—An incision was made on the temporal side of the corneo-scleral margin with a broad, lance-shaped keratome, the blade of which was passed behind the lens, so as to fix the last-named. Pressure was then made backwards through the cornea with a Daviel spoon, while simultaneously the keratome was slowly withdrawn from the eye, with the consequence that the lens came away through the wound supported upon the anterior surface of the knife. The exit of the keratome, however, was followed by "a moderate gush of aqueous and fluid vitreous." Ewing suggests that the same method might be applied successfully to the removal of a lens dislocated into the anterior part of the vitreous humour.

SYDNEY STEPHENSON.

(5) **Kuhnt**, of Bonn, advocates irrigation of the capsule sac in most cases of extraction, and practices the method himself very extensively. He employs a little rubber bulb with a special nozzle fitted to enter the wound easily. He points out that irrigation does not in any way render the removal of the immature lens less dangerous. Kuhnt's little bulbs appear eminently practical and simple, but the special forceps for squeezing them during sterilization seem unnecessary

T. HARRISON BUTLER.

(6) **Fejér**, of Budapest, describes the case of a woman of 36 years of age, with congenital aniridia in both eyes, a partial cataract, chiefly central, in one eye, and total cataract in the other. Vision in the latter was light perception with good projection. Extraction of the cataract was carried out without accident, and corrected vision of 5/70 was obtained.

A. J. BALLANTYNE.

(7) **Obarrio** has observed a number of cases in which, owing to the impossibility of consulting and obtaining the advice of a surgeon, the dislocated lens has been allowed to remain in the vitreous for a large number of years and has not set up any disturbance. From these observations, which have extended over many years, Obarrio concludes that the operation of reclination has been unduly neglected, and recommends that in cases where the cataractous

lens is tremulous, it should be reclined rather than any attempt be made to extract it, since such attempt would almost certainly be followed by a large loss of vitreous. HAROLD GRIMSDALE.

(8) In this paper **Elliot**, of Madras, reviews 550 cases, and shows that if a vision of 1/10 and upward be considered a success, the coucher can claim about 21 per cent. ; and in these the duration of sight is short-lived. The commonest cause of failure is iritis or irido-cyclitis, and next comes glaucoma, followed closely by imperfect dislocation of the lens. The author calls attention to the large amount of pigment in cataracts extracted in India, and to cyanopsia as a common sequela of extraction. A. H. PAYAN DAWNAY.

(9) **Ewing**, of St. Louis, describes his efforts to devise a pair of satisfactory cutting forceps for the removal of capsule in cataract extraction. He describes and illustrates his new capsule abscission forceps, but it is impossible to condense the description in such a way as to make it intelligible. Reference to the original is the only resort of those who wish to understand the instrument.

(10) In Kalt's method of suturing the wound in cataract operations, the corneal suture is placed vertically and the episcleral one horizontally. **Liégard** uses a thread armed with two needles and standing at the patient's right side, passes each suture horizontally from right to left, applying the fixation forceps at the sclero-corneal margin at 11 o'clock. By this modification he is able to steady his hand on the patient's cheek while passing the needle through the tissues and avoids the obstruction of the eyebrows, while the position of the forceps is such that it cannot cause any injury likely to interfere with the subsequent steps of the operation. R. J. COULTER.

(11) **Sumner**, of Fatehgarh, India, is a strong advocate of the intra-capsular method of extraction, and has had a modification made in the speculum whereby the lids may be safely manipulated by an assistant who is not so skilled as may be desirable. The handle of the speculum is bent so that the index finger can rest under it when in position in the lids and act as fulcrum, and the upper blade is narrower and projects further under the lid. The lids can thus be more easily lifted from the globe and squeezing prevented.* A. H. PAYAN DAWNAY.

(12) **Moret**, of Charleroi, writes enthusiastically about the virtues of the conjunctival suture in ordinary cataract extraction. In most cases the technical difficulties of Kalt's corneal suture are an objection. Moret makes his corneal section with a large conjunctival flap. Then, before the iridectomy or capsulotomy, passes a fine suture through the apex of the conjunctival flap and through the bulbar conjunctiva above it, leaving a large loop. In the bight of this loop the remaining steps of the operation are carried out, with the exception of the toilet of the wound—extraction of cortex, replacement of the iris—which is done after the suture is knotted, by introducing instruments at the corners of the wound. ERNEST THOMSON.

(13) **Best**, of Dresden, uses a broad keratome whose edges are incurved, so that at the point the angle between the edges is 60°, while the angle between the edges as a whole is 70°. A. J. BALLANTYNE.

(14) This assistant surgeon now extracts all cataracts by Smith's method. His figures for escape of vitreous are 5·92 per cent. during the operation, and 3·31 per cent. at the first dressing, "due to patients squeezing their eyes while counting fingers." There were twenty-two cases of rupture of capsule among the 422 operations. Among complications met with afterwards are prolapse of iris 1·5 per cent., panophthalmitis 1·4 per cent., iritis in two cases only. H. HERBERT.

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* See THE OPHTHALMOSCOPE, December, 1913, p. 751.

6.—The Orbit.

(1) **Gifford, H.—Definite resection of the outer orbital wall.** *Ophthalmic Record*, March, 1912.

(2) **Magitot, A. and Landrieu, M.—A simplification of Krönlein's operation. (Simplification de l'opération de Krönlein.)** *Ann. d'Oculistique*, novembre, 1912.

(3) **Genet.—Metastatic cancer of the orbit removed by "External curvilinear orbitotomy." (Cancer métastatique de l'orbite enlevé par "Orbitotomie externe curviligne.")** *Revue Générale d'Ophtalmologie*, 28 février, 1913.

(4) **Harman, N. B.—Case of exenteration of the orbit, with partial excision of the maxilla and ethmoid for rodent ulcer.** *Proceedings of the Royal Society of Medicine*, June, 1913.

(5) **Weeks, John E.—Restoration of the conjunctival sac after obliteration of the orbit. (Wiederherstellung des Bindehautsacks bei Schwund der Orbita.)** *Klin. Monatsbl. f. Augenheilkunde*, September, 1913.

(1) The modification of Krönlein's resection by **Gifford**, of Omaha, consists in:—1, making a horizontal incision, 2½ to 3 inches long, begining ¼ inch from the outer commissure, care being taken not to open into the conjunctival sac; 2, wide separation of the lips of the wound and shoving back the periosteum from the outer side of the bone; 3, removal with strong bone forceps of the outer margin of the orbit, and as much of the outer wall as desired; 4, opening of the periosteum of the orbit and proceeding as usual. None of the bone removed is replaced, but the results have been excellent, both from a cosmetic and therapeutic point of view. It is particularly recommended for tumours in the outer half of the orbit.

J. JAMESON EVANS.

(2) **Magitot** and **Landrieu,** of Paris, consider that the sole fault in the *technique* of Krönlein's operation consists in the risk of crushing or fracturing the bone when dividing it from without with a chisel-forceps or circular saw. To avoid this, they propose to pass a Gigli's or Delbet's thread saw through the pterygo-maxillary fissure and cut the base of the malar bone with it from within outwards. The steps of the operation are as follows.—The typical incision having been made and the flap turned back, the periosteum is stripped off the outer wall of the orbit and held, together with the contents of the orbit, towards the nasal side. The periosteum is stripped off the bony margin of the orbit and the temporal aponeurosis is divided. The entire external face of the orbital process of the malar bone is laid bare with a grooved director as far as the angle between it and the zygoma, which lies much deeper than generally thought, care being taken not to strip the external temporo-malar periosteum. The pterygo-maxillary fissure having been reached, the saw is passed through it into the orbit on a malleable director and the lower bony section is made with it. The upper section is then commenced with a saw and finished with a chisel. There is no modification in the rest of the operation.

R. J. COULTER.

(3) This article, by **Genet**, of Lyons, based upon a particular case of metastatic cancer of the orbit, is really a repetition of the advantages of the method of getting into the orbit described by Rollet (*Archiv. d'Ophtalmologie*,

juin, 1912) over other methods. The exact steps of the operation are not described systematically in this article, but, apparently, the method consists in first stitching the lids together to prevent injury to the cornea, and then making an incision down to the bone along the outer edge of the orbit. When the aponeurosis has been divided, the orbit can be fully explored without injuring important structures. By thus keeping to the outer part of the orbit, one avoids injuring the levator palpebrarum, the superior oblique, the lacrimal sac, or the inferior oblique. The conjunctival sac is not opened, and it is not necessary to divide muscles in order to get room to work.

ERNEST THOMSON.

(4) **Harman,** of London, gives the history of a most extensive case of rodent ulcer which began as a small pimple on the cheek so long ago as 1896. In 1905 the patient, then aged 54 years, had come to hospital with an ulcer as big as a farthing. She was treated by X-rays. An apparent cure would take place, yet the ulcer always recurred, and the patient herself remarked that "even when it had gone from the surface she could feel it thick under the surface." Later she had zinc ionization, and later still, radium. When first seen by Harman in 1911, the growth was so extensive as to call for very serious operative treatment. Two operations were performed. In the first the eye was preserved ; but the growth recurred and eventually the orbit was cleared out and extensive resection made of the maxillary and ethmoid bones. Apart from the graphic description which Harman gives of the case, the most important point is the moral which he draws, that no treatment for the radical cure of rodent ulcer can compare with cold steel. "When these little scabbed pimples appear they can be removed with definiteness and certainty within a few minutes, and no noticeable scar will be left. There is no such certainty and definiteness to be obtained by any other mode of treatment."

ERNEST THOMSON.

(5) The method of **Weeks,** of New York, depends for its success on the firm anchoring of the transplanted flap by attaching it to the periosteum and epiperiosteal tissue of the orbital margin. He considers every case suitable in which the skin of the lids is preserved, and in which suppuration is absent. Only one sac is attacked at one sitting. After an external canthotomy, the anterior layers of the lid—skin, muscle, and tarsus—are separated from the tissues behind, the dissection being carried down to the periosteum. A flap of skin, with as little subcutaneous tissue as possible, is taken from the inner side of the upper arm, a little larger than the surfaces to be actually covered, and it is folded longitudinally with the epithelial surfaces in contact. By means of three double-armed sutures passed through the fold, the flap is sutured into position, the threads being passed through the periosteum and epiperiosteal tissues and brought out through the lid about the level of the orbital margin, where they are tied over rolls of gauze. The edges of the flap are then stitched to the skin and the lining of the orbit and a gutta percha plate, previously moulded to the form of an artificial eye, inserted. This plate is left in position for a fortnight, when it is removed for cleaning and replaced. The anchoring stitches come out of themselves in about a week, and the other stitches are removed about the same time. The second operation may be undertaken two weeks later. The shrinking of the flap continues for about three months, and the size of the gutta percha plate requires to be reduced. The permanent state is reached in about three to five months. The plate must be worn until shrinkage has ceased.

Weeks has, since 1898, done 29 sacs in 19 patients, and all but one have given a satisfactory result. A. J. BALLANTYNE.

7.—Miscellanea.

(1) **Gifford, H. — On the management of non-closure of cataract operation wounds.** *Ophthalmic Record*, January, 1912.

(2) **Ohm, J.—Mechanical disinfection by aspiration. (Ueber mechanische Desinfektion durch Absaugung.)** *Centralbl. f. prak. Augenheilk.*, März, 1912.

(3) **Goerlitz, Martin.—A new sterilisable eye drop bottle. (Ein neues sterilisierbares Augentropffläschen.)** *Klin. Monatsbl. f. Augenheilkunde*, Juli, 1912.

(4) **Bordas, F.—A new arrangement for keeping sutures aseptic and ready for use after sterilization in the autoclave. (Nouveau dispositif pour la conservation aseptique des sutures prêtes à l'emploi après stérilization dans l'autoclave.)** *La Clinique Ophtalmologique*, 10 janvier, 1913.

(5) **Elschnig, A.—Asepsis of the hands. (Aseptik der Hände.)** *Klin. Monatsbl. f. Augenheilkunde*, Juni, 1913.

(1) **Gifford,** of Omaha, has adopted a plan of treatment of non-closure of cataract wounds which was suggested to him by Horner, of Zürich, and which consists in leaving off the bandages over the operated eye, which is covered only with a pasteboard shield to prevent injury from external violence, whilst the unoperated eye is covered with a moist dressing to help to keep it still. The lids of the operated eye are left perfectly unrestrained and free from the slightest pressure. Since adopting this plan, he has never found it necessary to resort to re-opening and to scraping the edges of the wound or to search for included capsule fragments sliding over conjunctival flaps, cauterisation of the wound, etc. He thinks it might be better still to hold the lids quiet with a narrow strip of plaster or a single skin stitch.

J. JAMESON EVANS.

(2) **Ohm**, of Bottrop, has adapted the vacuum cleaning principle to cleansing the cornea and conjunctiva in infective conditions and during or after operations. He employs a water jet aspirator and glass nozzles with openings of various sizes and shapes. He has used it with advantage in cases of corneal ulcer and corneal erosion, for removing soft matter from the conjunctival sac after operations on soft cataracts, and, finally, for rendering bloodless the field of operation in excision of the lacrimal sac. A. H. LEVY.

(3) One of the drawbacks of the Stroschein drop bottle is, that when the pipette is reversed during sterilisation the bottle becomes top-heavy, and there is also danger of contamination of the point of the pipette. In the modification introduced by **Goerlitz,** of Hamburg, there are two small lateral projections on the ground surface of the pipette, which, when the bottle is in use, occupy two notches in the edge of the bottle's mouth. When the contained solution is being sterilised the pipette is raised slightly and turned through 90°. The projections rest on the edge of the mouth of the bottle, and the steam escapes both through and round about the pipette. Reversal of the pipette is thus rendered unnecessary. A. J. BALLANTYNE.

(4) **Bordas**, of Santa Cruz, Barcelona, has invented a neat little metal box in which ready-threaded needles can be sterilized without risk of the threads becoming tangled, and from which single sutures can be withdrawn as

required. The arrangement is such that the needles lie in a separate compartment from the main length of the threads, the two compartments being separated by a layer of gauze, which is held in place by a ring. The box is made by J. Sala, Instrument Maker, Barcelona, Spain. ERNEST THOMSON.

(5) Experimental evidence has convinced **Elschnig**, of Prague, that it is impossible to produce absolute sterility of the hands. He is therefore of the opinion that for operations involving the use of sutures, or the contact of the hands with the wound, sterile rubber gloves ought to be worn. The gloves are powdered with sterile talc, then drawn over a pair of well-powdered thread gloves, wrapped in sterile gauze, and sterilised by heat in a metal box. The hands are washed for three minutes with soap and water and with spirit potash soap in running sterile warm water, then scrubbed with oxycyanide of mercury solution for half a minute, dried with a sterile compress, washed and scrubbed with 70 per cent. alcohol for half a minute, and again dried with a sterile compress. Each glove in turn is presented by an attendant, who stretches it by inserting four fingers. The surgeon removes the thread glove, rubs its powder over his hand, and slips his hand into the rubber glove. When both have been received in this way the gloves are carefully fitted to the fingers.

Gloves, hands, and instruments are all dry, which obviates the slipping of the instruments and lack of sensitiveness felt when the gloves and instruments are wet. A. J. BALLANTYNE.

V.—TRACHOMA.

(1) **Harrison, W. H., and White, Daniel W. — Management of trachoma among the Indians.** *Journal of Ophthalmology and Oto-Laryngology*, April, 1911.

(2) **Meyerhof, M.—On recurrent infections with trachoma. (Ueber wiederholte Ansteckung mit Trachom.)** *Centralbl. f. prak. Augenheilk.*, Oktober, 1911.

(3) **Meyerhof, M.—On spring catarrh associated with trachoma, and on spring catarrh in families. (Ueber Frühjahrskatarrh bei Trachom und über familiären Frühjahrskatarrh.)** *Klin. Monatsbl. f. Augenheilkunde*, Juni, 1912.

(4) **Nicolle, Ch., Blaizot, L., and Cuénod, A.—The baboon as an animal susceptible to trachoma, the filtrability of the virus, and the infective nature of the tears. (Le magot animal réactif du trachome. Filtrabilité du virus. Pouvoir infectant des larmes.)** *Ann. d'Oculistique*, septembre, 1912.

(5) **Bayer, Heinrich.—The combination of spring catarrh and trachoma. (Ueber die Kombination von Frühjahrskatarrh mit Trachom.)** *Klin. Monatsbl. f. Augenheilkunde*, Mai, 1913.

(6) **Nicolle, Ch., Cuénod, and Blaizot.—Experimental researches on trachoma. (Recherches expérimentales sur le trachome.)** *Ann. d'Oculistique*, juin, 1913.

(1) The ætiology of trachoma is first discussed by **Harrison** and **White**. The disease is described at length, together with its differential diagnosis.

The treatment is divided into prophylactic, surgical, and medical. Most important is prophylactic treatment. The surgical treatment most popular is "expression" of the granules by suitable forceps under cocaine anæsthesia. Sulphate of copper is still used in the solid form or otherwise. The ideal treatment of trachoma is prophylactic: individual towels, basins, beds, handkerchiefs, and the careful segregation of infected persons. Among Indians it is impossible to realise this ideal. The technic of "expression" is considered at length. Sulphate of copper may be in glycerine solution, gr. 50 to the oz., but the writers prefer the solid stick. Of all the number of cases seen by the authors, there has not been a single one in which copper stick or solution has done any injury. The ointment of the yellow oxide, in one or two per cent. strength, is also useful. Tannate of glycerine is used similarly to the glycerine copper solution or alternately with it. Argyrol in 25 per cent. solution is mentioned, but not recommended. In the later stages with corneal opacities and old pannus, dionine has a place. Patience and perseverance are very essential to the proper treatment of this disease. HENRY L. G. LEASK.

(2) **Meyerhof**, of Cairo, states that trachoma is a disease of infancy in Egypt. He has seen trachoma follicles in a child of three months, and coarse fleshy pannus in four-year-old children. He states that fresh trachoma is rare among the adult Egyptian population, but it does occur, and he has seen some 30 cases of fresh trachoma appearing on a completely scarred conjunctiva. He reports two cases, one a young officer, aged 20, who had had trachoma in childhood, but since the age of 12, had been perfectly free, and at the age of 17 had been entered into the army as completely free from trachoma; this man now had well-marked trachoma. The second case, was that of a young European lady who came to Egypt in 1905, aged 23, and soon got trachoma. This was treated, and after about two years, the right eye was completely cured; the left had the merest trace, which lasted about four years on account of insufficient treatment, when it again broke out and became acute, and about six weeks later, the right eye also developed acute trachoma, obviously a re-infection from the left. His conclusion is therefore that trachoma does not confer any, or any lasting, immunity. As to natural immunity, which has been stated to exist in the American negro races, Meyerhof states that he has seen trachoma in all forms, even the most severe, in the Soudanese, and in most of the Central African negro races, and therefore he is of opinion that a natural immunity does not exist. As to unilateral trachoma, and the belief that the other eye is immune, he states that monocular trachoma is exceedingly rare, and in two cases he has seen the healthy eye become infected, in one case five years, and in the other three years, after infection of the first eye.

A. LEVY.

(3) According to **Meyerhof**, of Cairo, the acknowledged difficulty of making a differential diagnosis between trachoma and spring catarrh is increased in those countries where trachoma is common by the fact that a true mixture of the two affections may occur. He has satisfied himself on this point, both clinically and by microscopical investigation. The statement, sometimes made, that the differential diagnosis between trachoma and the palpebral form of spring catarrh is easy, does not agree with his experience in the East. He goes through the many points on which reliance is usually placed for a diagnosis, and comes to the conclusion that two only of these points remain certain, namely, the tough elastic nature of the secretion, with abundance of eosinophile cells, in spring catarrh, and the microscopic structure of the conjunctival lesion.

When a true mixture of the two diseases occurs, it takes the form of implantation of spring catarrh on a pre-existing trachoma. In such cases the cornea usually remains free, but is sometimes the seat of epithelial proliferations and pannus or keratitis.

The author believes that spring catarrh may occur as a family disease depending on inherited predisposition. This opinion is supported by five cases in his experience where more than one member of a family suffered from the disease. He believes that in these cases infection can be excluded. Cases have already been published by other observers in support of the same belief. A. J. BALLANTYNE.

(4) **Nicolle, Blaizot,** and **Cuénod** published an article in the *Annales d'Oculistique* for June, 1911, in which they claimed to have produced in the chimpanzee a condition exactly resembling trachoma.* Owing to the rarity of this ape, its use in experiments is limited, and the same authors have continued their researches at the Institut Pasteur in Tunis, with a view to discovering one of the commoner monkeys which can also be infected with trachoma, and find that the baboon (*Macacus inuus*) is sufficiently susceptible to be used for the experimental study of the disease. A series of investigations with baboons gave results indicating that the virus of trachoma is filtrable, and that even in the very diluted condition in which it exists in the tears is able to cause infection, even where there is no breach of the conjunctival epithelium.

R. J. COULTER.

(5) **Bayer**, of Freiburg, gives details of a case investigated, both clinically and pathologically, at Freiburg, before the date of Meyerhof's important article, which appeared in 1912 (*see* No. 3 above). The diagnosis in these difficult cases is assisted by the search for eosinophile cells in the conjunctival secretion and also in the blood. Further help is given by the discovery of the Horner-Trantas points (small points on the limbus resembling calcareous deposits, found in spring catarrh).

The combination of spring catarrh and trachoma should be treated by excision of the tarsus, conjunctiva, and transition fold.

A. J. BALLANTYNE.

(6) **Nicolle, Cuénod,** and **Blaizot** give a *résumé* of their previously published experimental researches on trachoma, and report some further observations. Their paper may be summarised as follows:

(*a*) *Observations previously published.*—1. Among the lower apes which have been studied up to the present time the baboon is the only one which shows a definite sensibility to the virus of trachoma. This sensibility marks it out as a reacting animal in the study of trachoma. 2. The invisible cause of trachoma is a filtering microbe. 3. The tears of infected individuals are infectious if placed on an excoriated conjunctiva, or even by simple contact with a healthy conjunctiva. This, together with the extreme seriousness of trachoma and its lasting contagiousness, demands the most stringent prophylactic measures.

(*b*) *New observations.*—1. The virus of trachoma is destroyed by heating to 50° C. for 30 minutes. 2. The virus can be kept for at least seven days in glycerine. 3. During the course of an experimental attack of trachoma there seems to be increased sensibility to inoculation with virus, but after its complete cure, it appears to produce immunity.

An attempt was made to produce preventive immunity in a baboon. Five intravenous inoculations of virus prepared by grinding, diluting in physiological solution, and centrifuging, were given at intervals of three days, and 56 days later intra-conjunctival injection of virus in the right eye and inoculation with scarification in the left gave a negative result, while a positive result was obtained in a control baboon with virus from the same source. The authors intend to repeat this experiment, varying the conditions. Intravenous injections of prepared virus in healthy humans in two cases were not followed by any general or conjunctival reaction. Ten patients with severe trachoma were treated with from 1 to 4 intravenous injections of prepared virus from themselves or other patients, and a hundred received a subconjunctival injection apiece of virus obtained from themselves after curettage. In several of these cases this treatment was followed by considerable improvement, which was sometimes lasting. R. J. COULTER.

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*For abstract see THE OPHTHALMOSCOPE, Vol. IX. (1911), p. 661.

VI.—REMEDIES.

(*Second Notice.*)

(1) **Gorbunow, G. A.—Salvarsan in ophthalmic practice. (Salvarsan in der Augenpraxis.)** *Centralb. f. prak. Augenheilk.*, März, 1912.

(2) **Goldzieher, W.—A case of pannus trachomatosus cured by gonorrhœal infection. (Ein neuerlicher Fall der Heilung des Pannus trachomatosus durch Einimpfung blennorrhöischen Giftes.)** *Centralb. f. prak. Augenheilk.*, Mai, 1912.

(3) **Fehr, Oscar.—The effect of Salvarsan on the eye. (Ueber die Wirkung des Salvarsans auf das Auge.)** *Centralb. f. prak. Augenheilk.*, Juni, 1912.

(4) **Valude, E.—A note on a treatment for ulcerous keratitis in young dogs. (Note sur un traitement de la kératite ulcéreuse des jeunes chiens.)** *Annales d'Oculistique*, janvier, 1913.

(5) **Kayser, J.—Some of the newer eye remedies. (Einige neuere Augenheilmittel.)** *Woch. f. Ther. u. Hygiene des Auges*, 10 April, 1913.

(6) **Bernheimer, St.—Tuberculin in diseases of the eye.** *Wien. med. Wochenschrift*, 11 Oktober, 1913. Abstract (No. 342) *British Medical Journal*, 20 December, 1913.

(7) **Nicolle, Charles.—An atoxic antigonococcic vaccine. (Un vaccin antigonococcique atoxique.)** *Gaz. des Hôpitaux*, 21 octobre, 1913.

(8) **Cuénod, A. and Penet, R.—Treatment of gonococcal conjunctivitis by means of Nicolle and Blaizot's vaccine according to the results obtained in twenty-six cases. (Vaccinothérapie de la conjonctivite à gonocoques avec le vaccin de Ch. Nicolle et L. Blaizot, d'après vingt-six cas traités.)** *Annales d'Oculistique*, novembre, 1913.

(1) When salvarsan was first introduced, great caution was observed in its administration in cases of optic nerve disease. With increasing experience of its use greater confidence has been obtained and now it is used freely in cases even of early tabetic atrophy. In this connection **Gorbunow**, recounts some of his earlier experiences, bad ones with atoxyl and good ones with salvarsan. Gorbunow practices in Pjatigorsk, the Russian counterpart of Aix-la-Chapelle, and thus has great opportunities of observing and treating syphilitic affections. He records several cases in which salvarsan was administered for syphilitic affections complicated with varying degrees of optic nerve atrophy. In every case the result was markedly beneficial,

and such experiences will encourage others to use this valuable drug more freely.
A. H. LEVY.

(2) Although in this country one does not frequently see the severe pannus crassus of trachoma, still such does sometimes occur, and in this connection the case of **Goldzieher,** of Budapest, is interesting.—The patient, a girl aged nine, suffered from the severest form of trachoma, and was treated for the same on many occasions. On the last occasion she remained in hospital for three months without any improvement of the extreme condition of pannus, and so it was decided to try the effect of gonorrhœal infection of one eye, while the other was occluded. The restless child, however, managed to get the cover off, and so both eyes became infected. The result was beneficial beyond all expectation. The corneæ cleared up and the conjunctivæ became normal, except for the scarring. Of course, this drastic remedy would be used only in extreme cases, in which the gonorrhœal infection is not as dangerous to the succulent, infiltrated, and vascular cornea as it is to a normal avascular cornea.
A. H. LEVY.

(3) **Fehr,** of Berlin, has used salvarsan very extensively in various syphilitic eye conditions, and comes to the following conclusions.—In 2,700 syphilitic patients treated with salvarsan, he saw no case of damage to the optic nerves. There was no increase in the frequency of recurrences in cases so treated; on the other hand, there was a marked decrease in the frequency of iritis, neuroretinitis, and muscular affections. The conditions in which salvarsan is of most use are those cases where mercury helps most, but salvarsan is much quicker and much more energetic, and is especially useful in cases when the disease is of long-standing and where permanent damage is to be feared.
A. H. LEVY.

(4) **Valude,** of Paris, recommends tarsorrhaphy for the treatment of the ulcerous keratitis which is common in young dogs, especially bull-terriers, and which frequently spoils them for show purposes.
R. J. COULTER.

(5) **Kayser,** of Amberg, writes of the newer eye remedies, of which he appears to have enjoyed a wide experience. In the space at disposal it would be impossible to touch upon all the medicaments he describes, although a few lines may be devoted to the more important.

In blepharitis, Kayser praises noviform and histopin. Histopin is also of service in the treatment of hordeolum. In conjunctivitis Ems' salt solution, argyrol, or protargol (5 per cent. to 20 per cent.), and mercury oxycyanide have replaced silver nitrate in the author's practice. In follicular catarrh terminol has yielded satisfactory results. Noviform ointment is useful in phlyctenulosis, episcleritis, and corneal ulcer. Fibrolysin is of service in clearing nebulæ, however occasioned. In order to render the tissues more receptive, Kayser often instils dionine into the eye, and after some minutes, when chemosis has resulted, adds the fibrolysin. Pyocyanase (prepared from the *B. pyocyaneus*) is well spoken of in cases of hypopyon-keratitis, when not too far advanced. Kayser reports five such cases treated by pyocyanase, alone or in combination with hot compresses, and under this method the condition healed in from four to sixteen days. The acuity of three cases of incipient cataract was improved by the internal administration of iodostarin or of iodtropon and the local application of iodosolvin. Kayser treats affections of the lacrymal passages on conservative lines with fibrolysin, argyrol, protargol, and so forth. Hydrogen peroxide, in the form of "perogonal medicinal," is well spoken of as a disinfectant, The details are given of six cases of threatened panophthalmitis after operation or injury treated exclusively by Deutschmann's serum. The serum was used as a last resort, and the results were gratifying.
E. J. PRIMROSE.

(6) In the course of six years **St. Bernheimer** has given tuberculin for diseases of the eye to 425 patients, most of whom were markedly scrofulous. It was observed that when scrofula was complicated by streptococcal or staphylococcal infection, tuberculin did no good until the mixed infection was removed by drugs or an operation. Tuberculin was of special value in parenchymatous keratitis when Wassermann's reaction was negative, and there was neither a history nor a clinical sign of syphilis. Such cases—which constituted 8 to 10 per cent. of the total of 300 cases of parenchymatous keratitis—differed in no respect clinically from those of congenital syphilis. In many cases of parenchymatous keratitis in the subjects of congenital syphilis, a positive reaction to tuberculin was observed. In these cases antisyphilitic treatment, succeeded by treatment with tuberculin, gave very satisfactory results, particularly when repeated at certain intervals. Several cases of chronic iritis, irido-cyclitis, and disseminated choroiditis, in which syphilis was excluded, gave a positive reaction to tuberculin, and rapidly recovered under treatment with tuberculin. The permanent, as well as the immediate, effects were usually excellent, and the percentage of relapses was reduced from 50, as observed before tuberculin was given, to 20. At first, bacillary emulsion was injected. Later, albumose-free tuberculin was found to have a less violent action. In 70 cases this tuberculin, diluted with glycerine in the proportion of 1 to 5, was given by the percutaneous method. This is less effective, but is suitable for ambulatory treatment. The combination of the subcutaneous and percutaneous methods was the most effective, and was continued for four to six weeks in adults. Sometimes it was followed by a course of percutaneous treatment only. In the case of children, particularly when weakly, the treatment consisted of inunction only, and this was followed by injections only when a more powerful stimulus was required. The same procedure was adopted three to six months or more after the first course to prevent a relapse. The author points out the advantages of sunlight and mountain air as supplements to the treatment of tuberculous diseases of the eye with tuberculin.

(7) According to **Nicolle,** of Tunis, vaccino-therapy has not up to now enjoyed any marked success, owing to the toxic properties of the vaccines employed. This toxicity, common to all the vaccines, is particularly pronounced in the case of the gonococcus. A weak dose of the culture (living or dead), inadequate from a curative point of view, sets up so painful a reaction (local and general) that the institution of a regular and intensive treatment, by which alone useful results can be secured, has until now been impracticable. Antigonococcal vaccines, which have been on trial for seven years, yield, it is true, appreciable results, but only at the expense of a violent reaction which practically precludes their employment. It is necessary to rid a vaccine of its toxicity before it can be employed in the treatment of this or that malady.

Besredka found that a specific serum, placed in contact with the homologous microbe, fixed in the latter a special substance (*la sensibilisatrice*) which facilitated its destruction by the leucocytes and humours of the body. Nevertheless, the injection of vaccines prepared in that way was followed by constant and sometimes very violent reaction (Cruveilhier). The fixation in the microbe, moreover, was a temporary phenomenon only.

Working in conjunction with Blaizot, the author has succeeded in abrogating completely the toxicity of antigonococcic vaccine by culture of the micro-organisms in a special medium. The product keeps indefinitely by the use of a particular solution. In other words, the new vaccine is both stable and atoxic.

The results of this novel product are characterised as striking. Twenty-four cases of gonococcal ophthalmia have been treated by its means. The disease is cured by several inoculations, and, indeed, sometimes after a single injection. The day following the first application, the baby is able to open his eyelids, and there is no longer any risk of grave complications. The action of the vaccine is said to be equally striking in some of the other acute complications of gonorrhœa, as, for example, in orchitis, arthritis, as well as in gonorrhœa (acute or chronic) itself.

The way of using the vaccine is simplicity itself.—The only instrument needed is a syringe of 2 c.cm. capacity. The injection is made into the gluteus maximus or into the veins. Subcutaneous inoculation is best avoided, inasmuch as it causes a little pain. In acute cases injections are made every day or every other day: in chronic cases every two to four days. Two *ampoules* are provided, one of vaccine and the other of physiological solution. Half a cubic centimetre of vaccine is drawn into the syringe, which is then filled with the water. That dose is injected. SYDNEY STEPHENSON.

(8) The results obtained by **Cuénod** and **Penet,** of Tunis, in the treatment of seven cases of gonorrhœal ophthalmia by means of a new vaccine (prepared by the Pasteur Institute of Tunis) were summarised on page 57 of the last number of THE OPHTHALMOSCOPE. This particular vaccine contained gonococci, cultivated by the usual methods, and injected washed and living. In babies it was injected subcutaneously and in other subjects into one of the veins at the bend of the elbow. The application was followed in half to one hour by a rise in temperature or 39° or 40° C., ushered in by shivering, but these general symptoms soon passed away. Improvement, sometimes of a remarkable nature, generally followed the second injection, practised two or three days after the first.

The present communication deals with eighteen cases treated by two kinds of vaccine:

1. A vaccine containing sensitized living gonococci.
2. A vaccine containing killed, stable, and atoxic gonocci—that is to say, Dmégon's *vaccin atoxique* prepared in accordance with the new formula of Nicolle and Blaizot, as described by them at the Academy of Sciences on October 6th last.

Nine patients were treated with each kind of vaccine.

With regard to the first series, the general reaction, although constant, was much less pronounced than in the patients treated by the washed and living gonococci described in the first communication. Excellent results were obtained in five babies. In adults the remedy did not act so well, but one of the two adult patients, aged 18 years, was in a hopeless condition when received, and although the injection did nothing for the necrosis of the corneæ that was present, yet the injections speedily put an end to the purulent secretion from the conjunctiva.

With regard to the second series, no general reaction followed the use of the atoxic vaccine, which had the further advantage that it could be injected into the gluteal region. In a couple of adult patients exceedingly good results were obtained by its employment.

This important communication is best concluded with the author's own words, as follows:—"We conclude from the 26 cases of gonococcal ophthalmia that we have treated during the last eleven months, that Nicolle and Blaizot's antigonococcal vaccine provides us with a certain weapon in the terrible fight against purulent ophthalmia due to gonococci. In the first cases we employed at the same time as the vaccine the ordinary measures (silver nitrate, argyrol, and frequent and copious *lavages*). In the last cases, without abandoning frequent washings with physiological serum, we suppressed all active collyria, and since these cases have shown the best results, we believe that an incontestible proof has been furnished of the efficacy of the new vaccine."

SYDNEY STEPHENSON.

CORRESPONDENCE.

While THE OPHTHALMOSCOPE will at all times welcome correspondence from its readers, the Editor does not hold himself responsible for any views expressed in this column.]

PANOPHTHALMITIS FOLLOWING CATARACT EXTRACTION.

To the Editor of THE OPHTHALMOSCOPE.

SIR,—In Mr. Harrison Butler's paper on a case of panophthalmitis appearing in your January issue, he says " Elliot extracted 1,000 consecutive cases with a septic incidence of 1·06." Mr. Butler, in the same paragragh, quotes the results of a number of other surgeons, and as far as I can make out, he is in every case dealing with their precentages of *suppuration* or *panophthalmitis*, whereas the figure he quotes for me has a very different significance, since there was only one single case of panophthalmitis in the series of 1,000 extractions under review. My paper dealt fully with the other cases which were, with one exception, instances of mild types of subacute iritis, resulting in vision varying from 6/5 to perception of hand movements. I may add that I have since done over 1,000 consecutive extractions without a single suppuration. I attribute these results entirely to the *technique* which I advocated in the paper Mr. Butler refers to (*Trans. Ophth. Soc. U.K.*, Vol. XXIX, pp. 62, *et seq.*).

I am fully aware that the statement made by Mr. Butler was merely an oversight on his part of the fact that others would not know the paper he quotes from as well as he does himself; but as those who have not read it carefully will be liable to be seriously misled, I shall be obliged by your publishing this letter.

Yours truly,

R. W. ELLIOT, M.D.,
I.M.S.

143, HARLEY STREET, LONDON, W.,
Jan. 3rd, 1914.

BOOK NOTICES.

Uma Estatistica Ophtalmologica. Por SEBASTIAO COSTA SANTOS. Baseado no Registo de 60,000 Doentes da Consulta d'Ophtalmologia do Hospital de S. José, Lisboa. P.p. 84 ; with 27 tables. 1913.

This pamphlet gives the statistics of the Ophthalmic Clinic at the Hospital of S. José, Lisbon, from the time of its foundation to the middle of 1912. The actual number of patients considerably exceeds the 60,000 named in the title.

There are four chapters : the first, very brief, shows the growth of the clinic from 1894 to the present day and the second gives a general view of the statistics.

There are a few points which are sufficiently notable : the total number of cases of refraction among the sixty thousand, is only 1,360, and this number includes the presbyopes. To the tired ophthalmic surgeons of some of our British Hospitals, where the proportion seems almost reversed, this srate of things may seem enviable ; but the author rightly deplores it as an indication of the general illiteracy of the population of Portugal.

On the other hand, the affections of the conjunctiva, and especially ophthalmia neonatorum and trachoma, form an undue proportion of all cases. The former number 1,094, *i.e.*, about 1·8 per cent., and the latter 3,339, *i.e.*, about 5·5 per cent. of all cases.

Of the trachomatous patients, about 25 per cent. had pannus, but only something over 2 per cent. (75) had entropion. This proportion is very small, and says much for the efficacy of the treatment. Even if we include all the cases labelled trichiasis the total number is only 200, *i.e.*, 6 per cent. and from these must be deducted senile spasmodic entropion.

The third chapter deals with contagious diseases and syphilis ; the latter seems less frequent in Portugal than in England, to judge from the fact that only 1,152 patients, *i.e.*, 1.9 per cent., are recorded to have suffered from this disorder.

The last and longest chapter is devoted to the subjects of ocular traumatism. These make a very large part of the whole ; no less than 8,377 of the number. This is about 14 per cent., and in some years the percentage is as much as 18 per cent. The examination of the ages of the sufferers shows that the age most liable to accident is that of apprenticeship, when the learner is yet unaware of all the risks he is running and of the methods of safeguarding himself. Among all this large number, which includes 858 severe injuries, ("*grandes traumatismos*") there were only four cases of sympathetic inflammation—a very small number—but we are not told how the injuries were dealt with, what proportion submitted to immediate excision, and other points which would help us to from an accurate judgment on the risk of sympathetic inflammation to the other eye, if treatment were not immediate and radical.

HAROLD GRIMSDALE.

Herpes iridis and other rarer herpetic affections of the eye. (Ueber Herpes iridis und andere seltenere herpetische Augenerkrankungen.) By W. GILBERT. *Sammlung zwangloser Abhandlungen Aus dem Gebiete der Augenheilkunde.* Bd. IX, Heft ii. 1913. Halle : Karl Marhold.

Gilbert, of Munich, devotes his *brochure* mainly to the consideration of a species of iritis of peculiar form which is characteristic of the herpetic affections of the eye. It is not a secondary iritis complicating a corneal condition, but a true primary herpetic affection of the uveal tract, and has been found by the author both in herpes zoster and in herpes febrilis. He believes that it is not very rare, having found it, in the course of three years, six times in forty cases of herpes corneæ febrilis, once in four cases of herpes zoster, once in keratitis neuroparalytica, and once in a case of vitiligo. These affections all resemble each other in the presence of a trophoneurosis or a trophic disturbance in the region of the fifth nerve.

The author describes the clinical characters of the iritis as seen in a case of herpes zoster, since in this condition it is apt to occur as an isolated phenomenon without corneal complication. The iritic inflammation begins from the eighth to the fourteenth day after the appearance of the eruption, with intense ciliary injection, and perhaps with chemosis. The cornea may be perfectly clear or slightly dim. The aqueous is turbid, the iris strongly hyperæmic, the pupil small, and its margin attached to the anterior surface of the lens. Then there appear circumscribed nodular swellings on the pupillary part of the iris, of yellowish-red colour. From a few hours to a day or two later, hyphæma occurs from rupture of vessels in these swellings, which then subside. The formation and rupture of these swellings may be repeated, and their disappearance is always accompanied by relief of pain. The hæmorrhage may completely disappear, leaving no sequelæ, but if repeated, there may be cicatricial changes in the iris, and an organised deposit in the pupil.

Observation of this form of iritis in herpes febrilis is not so easy on account of the corneal complications, and it may be overlooked unless very frequent and careful examinations are made. The author is of the opinion that it occurs in fifteen per cent. of these cases, and that its occurrence is not related to the severity of the corneal involvement. It comes on from the second to the fifth week, and is ushered in with severe neuralgic pain. In all other respects it follows the same course as in herpes zoster. The six cases of this group included five men and one woman, whose ages were from 57 to 83 years. Of the forty cases of herpes febrilis to which they belonged only fourteen were over fifty years of age, among these being the six cases referred to. The condition of the blood-vessels in these persons suggests that senile changes in the blood-vessels predispose to the hæmorrhagic type of iritic affection.

It was found that where not more than two hæmorrhages occurred the prognosis was good, while repeated hæmorrhages were apt to leave serious after-effects.

No histological examination has been made in a clear uncomplicated case, but from examination of allied forms of disease, Gilbert concludes that herpes iridis leads to the formation of capillary nævi whose rupture may be followed by their complete disappearance. A. J. BALLANTYNE.

Visual Optics and Sight-Testing. By LIONEL LAURANCE. Size of book, 9 inches by 6 inches by 1 inch. 392 pages. Good index. Two full page illustrations and 148 figures in the text. Price 10s. 6d. net. Published by the Author, Temple House, Temple Avenue, E.C. 1912.

This is a comprehensive work of some 400 pages, written by Mr. Lionel Laurance, who is described as "Official Instructor" to the Spectacle Makers' Company.

The first portion is devoted to a consideration of the anatomy of the eyeball and to the physiology of vision. Later on come chapters on the various anomalies of vision, and the order to be followed in estimating these defects.

The various objective methods are described at some length, and the concluding portion deals with certain ocular calculations and a dissertation on frames and lenses.

The object of the book is to "cover . . . all that is essential for the sight-testing optician." It may be said at once that the information given is so full and elaborate that anyone comprehending and retaining it all will indeed be well equipped for refraction work. In the next sentence the author naïvely adds, "That I shall not have succeeded, will be but natural," leaving the reader to decide whether it is his own shortcomings, or those of his readers, which weigh upon his mind.

While the optical portion of the work is evidently written by one with a full understanding of the physical problems, the physiological and pathological demonstrations often display the lack of that true comprehension which only a medical training can convey. Thus, in describing the retina, we are told little more of it than that it consists of "ten layers." What impression can be conveyed to anyone by such a description as this ?—

"4. *Internal molecular layer.* A fine network of fibres, which shut off the large blood vessels from the posterior layers. 5. *Internal granular layer.* 5. *External molecular layer.* Similar to No. 4. It shuts off communication with the capillaries."

Surely, in this year of grace, the work of Ramon-y-Cajal and the neurone chain theory should have shed their illuminating influence beyond the circle of medicine and brought some light to the student of physiology. The "layer" idea belongs to the period of mere structural description of tissues whose functions were unknown.

Under the head of accommodation we are told that the increased curvature of the crystalline lens is proved by "the experiments of Helmholtz, Cramer, Purkinje, Tscherning and others." Thomas Young, the great English philosopher, who described it half-a-century before anyone else, and whose classical experiments will live to the end of time, is surely worthy of a place in this list. The field of vision is said to extend "outwards 90 degrees." Perhaps that is why the gorgeous shop perimeters will only carry the object outwards to that extent, for none of them will measure the external boundary of a visual field. Mr. Lionel Laurance must teach them better physiology. On another point, however, he is ahead of the medical text-books. Fechner's law is there always expressed in terms of "the logarithm of the stimulus" and as only one student in a hundred has any idea what that means, the law is more often quoted than understood. Mr. Laurance places it in a proper light in speaking of an increment of 1 per cent. of the total stimulus as being the least discernable increase of sensation.

A post-operative coloboma is not an "iritic gap," although the author may perhaps be excused, seeing that in a manual of eye diseases, one of "the Student Aid Series," we are told about the development of the "iritic circle" (*sic !*). Of course, some operators often get an iritic gap, but it is hardly kind to speak of it. Haidinger's Tufts are illustrated by an "original photograph by Professor Barrett." Even this eminent investigator of the spirit world can hardly have succeeded in photographing one of his own sensations ! If Mr. Laurance will turn to Professor Barrett's paper he will find in it a photograph of a drawing of a phenomenon as he perceives it.

One of the features which might well be eliminated is the irritating use of contracted expressions. Thus, instead of saying that the refractive indices of the aqueous and cornea are nearly the same, it is written "the μ's of the aqueous and cornea ;" "The retina and ∞ are, therefore, conjugate distances."

That the problems of physical optics and of visual optics are ably dealt with is the enduring impression of anyone who reads this book, but we must point out to the author how little genuine help is given to the lay mind in its search for a better understanding of the physiology of a complex living organ. That portion should be remodelled on wholly different lines. One last quotation will appeal forcibly to our readers, and we should like to see it prominently placed in every optician's room :

"The optician's duty with cases of disease, or suspected disease, is simply to inform his customer that, in his (the optician's) opinion, it would be advisable that a medical man be consulted to make sure that there is nothing more than an optical trouble. Should the customer demur, the optician can only state that he considers this to be the proper course, and that either he will not supply the glasses, or will do so only at the special request of the client. On no account should he state that there is a disease present, much less should he say what disease he suspects. He might very well be mistaken . . ."

It will be clear from the foregoing that Mr. Laurance's influence is being whole-heartedly used to restrain the optician from over-zealous meddling, an effort in which he has the good wishes of every ophthalmic surgeon.

NOTES AND ECHOES.

Deaths.

We regret to announce the death of Mr. Sydney Jones, who was the first ophthalmic surgeon to St. Thomas's Hospital, London. Death occurred at Balham on December 9th, at the age of 82 years. Mr. Jones's reputation, however, was made as a general surgeon.

With deep regret we announce the death of one of the pioneers of modern ophthalmology, Dr. John Green, who had practised at St. Louis for forty-seven years. He died on December 7th last in his seventy-ninth year. A student of Donders, he always devoted much attention to the problems which surround refraction and accommodation, and was recognised, both in his own country and elsewhere, as an authority upon those subjects. His name is associated with an ingenious operation for the relief of entropion and trichiasis. His character as a man stood as high as his reputation as an ophthalmic surgeon. He will be sorely missed by friends, colleagues, and patients alike. R.I.P.

The following deaths are also announced among American ophthalmic surgeons :—

Dr. A. L. Derdiger, of Chicago, at the age of 47 years.

Dr. Walter J. Pennell, at Auburn, aged 50 years.

Dr. Charles E. Michel, of St. Louis, at the age of 80 years.

Dr. S. R. Weaver, of Sherman, Texas, at the age of 41 years.

Dr. R. L. Edwards, at Richmond, Va., on November 12th, 1913.

Dr. T. Wistar, of Philadelphia, at the age of 77 years.

The death is announced from Aachen, where he practised his profession, of Dr. Paul Greven. He was a well-known contributor to the pages of the *Wochenschrift für Therapie und Hygiene des Auges.*

* * * *

Appointments.

Mr. Arthur Zorab has been appointed ophthalmic surgeon to the Royal Hants County Hospital at Winchester.

Mr. Malcolm Hepburn has been appointed to the Joint Lectureship on Ophthalmology at the Royal Free Hospital (London School of Medicine for Women).

Mr. Frank Moxon has been appointed ophthalmic surgeon to the Marylebone General Dispensary.

Mr. Cole Marshall has been appointed assistant surgeon to the Western Ophthalmic Hospital, London.

Mr. E. Arthur Dorrell has been appointed assistant ophthalmic surgeon to the Prince of Wales' General Hospital, Tottenham, London, N.

Mr. T. W. Letchworth has been appointed ophthalmic surgeon to Out-Patients at the Hampstead and North-West London Hospital.

Mr. Arthur Greene has been appointed full surgeon to the Norfolk and Norwich Eye Infirmary.

Mr. Harry Lee has been appointed ophthalmic surgeon to the Leeds Public Dispensary.

Mr. F. A. Anderson has been appointed assistant surgeon to the Eye, Ear, and Throat Hospital for Shropshire and Wales, Shrewsbury.

Dr. Lee Masten Francis has been elected attending ophthalmologist at the Buffalo General Hospital, succeeding Dr. Lucien Howe, who has been elected to the consulting staff.

Dr. Aubaret, of Bordeaux, has been nominated professor of ophthalmology in the Marseilles School of Medicine in succession to Dr. Guende, deceased.

* * * *

XIIth International Congress of Ophthalmology.

The XIIth International Congress of Ophthalmology, as already announced, will be held at St. Petersburg from the 10th to the 15th of August next.

Grave exception has been taken by our colleague Professor Julius Hirschberg, editor of the *Centralblatt für praktische Augenheilkunde*, to the restrictions placed upon Hebrew members of the Congress, who, according to a circular issued in December last, must conform to certain rules and leave Russian territory by a particular date in September, 1914. Hirschberg energetically protested in a recent number of his periodical (December, 1913, p. 395) against what he evidently considered invidious distinctions opposed to the true spirit of science. He withdrew his name from the executive of the Congress, and even went the length of advising his co-religionists to absent themselves altogether from the meeting. Although under ordinary circumstances persons of the Jewish faith have considerable difficulty in obtaining a *visa* before being allowed to enter Russian territory, yet it is satisfactory to note that on the present occasion more liberal official counsels have prevailed. The offending circular has been cancelled, and in the one issued in its stead only the other day we are glad to find the following words: "The Ministry of the Interior has authorised the free entrance of all Israelitish Members." Like all other visitors to Russia, Hebrews must now merely produce a passport bearing the recent *visa* of a Russian diplomatic or consular officer. This concession should meet the difficulties raised by our Berlin colleague, and tend to the smooth working of the Congress.

The term for the sending in of communications has been prolonged to the 1st of April, 1914.

* * * *

Ophthalmological Society of the United Kingdom.

THE next annual meeting of the Ophthalmological Society will be held on April 23rd, 24th, and 25th. Communications will be read at the house of the Royal Society of Medicine, 1, Wimpole Street, W., and the clinical part of the business will be carried out in the new buildings of the Central London Ophthalmic Hospital, Judd Street, W.C. The Bowman Lecture, as already announced in these pages, will be delivered by Professor W. Uhthoff, of Breslau, on the 24th, and will be followed by the official dinner of the Society. The subject selected for discussion by the Society deals with the "Post-operative complications of Cataract Extraction," and will be introduced by Messrs. E. T. Collins and H. Herbert.

* * * *

Recent Estates and Wills.

MR. EDWARD NETTLESHIP left estate of the gross value of £26,768, with net personality sworn at £23,225. The testator left, subject to some small legacies, his property to his wife, Mrs. Elizabeth Endacott Nettleship, for life, and on her death, £3,000 to St. Thomas's Hospital to create or augment a fund for the endowment of lectureships in the Medical School, £1,000 to the Royal London Ophthalmic Hospital, and, subject to some further bequests, he directed that if the ultimate residue of his property should exceed £9,000 then a further £2,000 should be paid to St. Thomas's Hospital Medical School for the same purpose as the above legacy of £3,000, and £1,000 additional should be paid to the Royal London Ophthalmic Hospital.

Dr. Tempest Anderson, of 17 Stonegate, York, Consulting Ophthalmic Surgeon to the York County Hospital, a former Vice-President of the British Association, and an authority on volcanoes, who died at sea on August 26th last, aged 66 years, left estate of the value £97,365.

* * * *

Oxford Ophthalmological Congress.

THE next meeting will take place at Keble College from July 8th to 10th next. The discussion, to be opened by Mr. William Robinson, of Sunderland, will deal with "Workmen's Compensation in Injuries of the Eye." Among distinguished visitors who have already announced their intention of being present at the Congress may be mentioned the names of Dr. Darier (Paris), Professor Deutschmann (Hamburg), Dr. Dor (Lyons), Dr. Casey A. Wood (Chicago), and Dr. Wendell Reber (Philadelphia).

* * * *

Dr. E. Javal's Library.

MADAME JAVAL has donated her late husband's collection of books to the eye clinic of the Hôtel Dieu, Paris. She has augmented her generous gift by completing to the end of last year the many periodicals, French and otherwise, which the library included. The library is open free on application to the Doyen of the Faculty of Medicine or to the Professor of Ophthalmology to students and medical men on three afternoons a week, except during the month of August. The volumes, however, may not be taken out.

* * * *

Herman Knapp Memorial Eye Hospital, New York.

THE Herman Knapp Memorial Eye Hospital has been opened at the corner of 57th Street and 10th Avenue, New York. The hospital was founded by Dr. Herman Knapp in 1869, under the name of the "New York Ophthalmic and Aural Institute," and was located at 44 and 46 East 12th Street. During these years 420,000 cases have been treated. The new building is a fire-proof construction, provided with complete equipment for its purpose.

* * * *

Oxford Eye Hospital.

THE general committee of the Oxford Eye Hospital has decided to honour the name of its founder, Mr. Robert W. Doyne. On the proposal of Mr. Menteith Ogilvie, it was decided at a recent meeting that in future all official documents should bear the words, "Founded by Robert Walter Doyne in 1886," immediately beneath the name of the institution. That the general committee has lost an excellent opportunity of commemorating in some really tangible form the name of its founder, will be the conclusion of most persons on learning the somewhat trivial guise the honour has taken.

* * * *

Sir John Tweedy.

SIR JOHN TWEEDY has been appointed a civilian Member of the Naval Medical Consultative Board.

* * * *

Chauffeurs and Eyesight.

LEGISLATION has been introduced in the French Chamber of Deputies requiring that chauffeurs shall have their eyes tested, and furnish a certificate of normal sight and hearing.

* * * *

Colour-blind Seamen.

ACCORDING to a recent Board of Trade report on sight tests for the mercantile marine, 9,646 candidates were examined in the period January 1, 1912—March 31, 1913, for form vision test, and 252 failed. 9,394 were examined in colour vision, and 293 failed. Complete red blindness was found in 49 of the men tested.

Distinctions. THE title of professor has been bestowed upon Dr. H. Wilbrand, of Hamburg and Dr. H. Gebb, of Greifswald.

* * * *

University of Illinois. IN the re-organized College of Medicine of the University of Illinois—formerly the College of Physicians and Surgeons, Chicago—the following compose the teaching staff of the Department of Ophthalmology:—Casey A. Wood, Professor of Ophthalmology and Head of the Department; William E. Gamble, Associate Professor of Clinical Ophthalmology; J. B. Loring and E. K. Findlay, Assistant Professors. Instructors:—Charles C. Clement, Frederick D. Vreeland, Lawrence W. Whitmer, Georgiana Dvorak-Theobald, Herbert Walker, and Marie A. Motis.

* * * *

Workmen's Compensation Act, 1906. THE Home Secretary requests us to announce that in consequence of the resignation of Dr. Edgar Stevenson the appointment of Medical Referee under the Workmen's Compensation Act, 1906, for all ophthalmic cases arising in County Court Circuit No. 29, is now vacant. Applications for the post should be addressed to the Private Secretary, Home Office, and should reach him not later than the 4th February next.

THE OPHTHALMOSCOPE DIARY.

	1914.	
Midland Ophthalmological Society	February 3rd	Birmingham.
Section of Ophthalmology: Royal Society of Medicine.	February 4th	London.
Section of Ophthalmology: (Combined Meeting) Royal Society of Medicine.	February 26th	London.
Section of Ophthalmology: (Combined Meeting) Royal Society of Medicine.	March 4th	London.
Midland Ophthalmological Society	April 7th	Birmingham
Ophthalmological Society.	April 23rd to April 25th	London.
Section of Ophthalmology: Royal Society of Medicine.	May 6th	London.
Section of Ophthalmology: Royal Society of Medicine.	June 10th	London.
Oxford Ophthalmological Congress	July 8th to July 10th.	Oxford.
British Medical Association: Section of Ophthalmology.	July 15th to July 17th.	Aberdeen.
International Congress of Ophthalmology.	August 10th to August 15th.	St. Petersburg.

THE

OPHTHALMOSCOPE.

A MONTHLY REVIEW OF CURRENT OPHTHALMOLOGY.

VOL. XII.—No. 3.] *MARCH 1, 1914.* [TWO SHILLINGS.

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ORIGINAL COMMUNICATIONS.

AN APPRECIATION OF AMERICAN OPHTHALMOLOGY.

BY

R. H. ELLIOT, M.D., F.R.C.S.,
LONDON, ENGLAND.

IN the course of two months at the close of 1913, the writer had the opportunity of visiting fourteen of the leading towns of the United States of America, inclusive of New York, Chicago, Boston, and Washington. He travelled some 6,000 miles by rail, attended two large medical congresses, *viz.*, the Congress of the American Academy of Ophthalmology and Oto-Laryngology at Chattanooga, and the Congress of Clinical Surgeons at Chicago. It was estimated that at the latter alone 5,000 surgeons were present. He saw not only the Eastern Cities, but some of those of the West and the South as well. From every side he was overwhelmed with courteous invitations to visit great cities, and everywhere he went he was entertained with lavish kindness, and was given a welcome which has no parallel even in his experience of the world-famed Indian hospitality. At each place he visited, he was not merely the guest of his host, who was the leading or, one of the leading, ophthalmic surgeons of the neighbourhood, but he was also made to feel that he was the guest of the whole of the local Ophthalmological Society. Each such body had organised a meeting at which he was asked to appear. There he met, lectured to, was interrogated by and talked to, the ophthalmic surgeons of the district.

In these fourteen towns visited he was asked to operate in no less than twenty-eight hospitals, and 135 cases of glaucoma were presented to him for trephining.

It would be impossible to emerge from such a tour without having obtained some very definite impressions of the great body of ophthalmic surgeons whom the writer was thus privileged to meet. He gathers from what he learnt in America that comparatively few European ophthalmic surgeons, and very few British ones, have spent any time in seeing what is being done in that vast and rapidly-growing country. It is with the hope of inducing others to visit America that he pens this article, taking up in turn those features of American ophthalmology which struck him most strongly.

(1) The number of Medical Men who are practising Ophthalmology in the many great centres of the U.S.A.

At every centre, as has already been said, the writer was the guest of the local ophthalmologists, and was invited to address their Society. In Chicago they numbered nearly 150; in Minneapolis, 2,000 miles west of New York, the Minnesota Academy of Ophthalmology turned out about 50 ophthalmologists to meet him, and even the smallest centres he visited could assemble between 20 and 30 such specialists, whilst at the annual meeting, at Chattanooga, of the Academy of Ophthalmology and Oto-Laryngology, at whose invitation in the first instance he went to America, there were about 180 members present. It is true that many of these men practise oto-laryngology side by side with ophthalmology. The needs of the country still demand this in many centres, but they are none the less very highly skilled ophthalmologists, men who are well read and whose practical experience is so large that they could hold their own in almost any company. They are not a mushroom growth of pseudo-specialists, but a body of soundly educated keen men who read assiduously the current ophthalmological literature of the day, who can tell you what is being done in Germany, in France, in Japan, or elsewhere, and who do not hesitate in their own line to prove all things, and to hold fast to that which in their own judgment is good. Many of their names are widely known wherever ophthalmology is practised, but there are to be met not a few whose work would seem to demand a much wider recognition than it gets—men who are quietly and unostentatiously doing magnificent service, whilst at the same time training and moulding a rising generation of ophthalmologists. It does not seem to have occurred to many of these that they are doing anything out of the common run. Their immediate *confrères* are proud of them, their more distant fellows speak of them as "fine men," but I think that the true greatness of their work has not dawned either on themselves or on their countrymen. America possesses in such workers an asset which I believe will before long place her first in the ophthalmological world. They and their teaching represent a great force that is destined to assert itself in the near future, a force which can no more be imprisoned by modesty, by want of recognition, or by prejudice, than the tide can be controlled by banks of sand.

(2) The High Standard of the American Medical Schools and Universities.

So many of us have grown up to look askance at an American qualification that we fail to realise the great change which has been and is being wrought in the standards now accepted in the United States. It was the writer's privilege, whilst the guest of the leading ophthalmologists at the various centres he visited, to meet in friendly social intercourse with many of the out-standing men in other lines of medical work. To hear such men speak of their struggles, of their hopes, and of their fast-vanishing fears and difficulties was an inspiration. The American medical profession has felt through its vast frame the strength of a great giant; it has shaken off sleep and apathy; it means to cleanse its house and set it in order, be the cost what it may; and it will carry its intentions into effect. Slowly but very steadily, bogus schools and universities are being wiped off the slate; homœopathic medicine is being quietly suffocated out of existence; a high tone of medical ethics is rising even in the most distant parts, and the steady spade-work of a body of medical men, of whom any country might well be proud, is having its effect. It was most interesting to listen, in various far-scattered centres, to the recital of how all this is being brought about. History was repeating itself at each fresh place. Men spoke of what was being done, not in a spirit of brag, but as a simple recital of struggles, past and present, as men, the wide world over, speak of their efforts to accomplish that which really lies next their hearts. The sceptic will reply that there is still much in American methods of practising medicine which is open to criticism; that commercialism makes ugly splashes on the picture; and that specialism is even now vaunted by many who have no just claim to the title. The man who has learnt from experience to be fair, if not generous, will not look on the stains that are still left, but rather on the dogged struggle against odds, and on the great accomplishments of the past; and he will assuredly prophesy for American medicine as honourable a future as can be boasted by any of the older nations of the earth. It was the writer's privilege to be present at the inaugural meeting of the American College of Surgeons in Chicago, and to listen there to the great speeches delivered by Sir Rickman Godlee, and by the first President of the new College. Each address was a masterpiece of its kind, and through the latter there vibrated and resounded the magnificent spirit of a young nation's determination to cleanse itself from all evil, be the cost what it might. The room was crowded with the flower of American surgery, and although the occasion was one of dignified restraint, there could be no mistaking the deep underlying current of the College's determination to carry out to the full the great programme outlined by its first leader.

(3) The facilities for Research.

The American ophthalmologist has travelled the wide world over in search of knowledge, and he has brought back with him to *every* centre of knowledge, not sporadically, but as it were epidemically, the German spirit of research. Wherever the writer went, he found men engaged on such work, and that too not in the miserable laboratories in which so much of Europe's best work has had to be done in the teeth of difficulties, but in magnificently equipped buildings, erected and furnished regardless of cost by men who had studied in many lands the requirements of the situation, and who had not failed to profit by the mistakes as well as by the successes of others. A nation that builds a post office, a railway station, or a library on the lines of an emperor's palace, can be trusted to know how to erect an institute for research. Wealthy men have come forward freely, and in various centres in America you may see young men, yes, and older men too, paid a living wage to indulge to their heart's content their yearning for original investigation. Apparatus, equipment, instruments, and material are all liberally supplied, and enthusiasm, so marked a characteristic of the race, is simply overflowing amongst the workers. Such conditions are fated to write large the names of America's sons across the pages of all branches of medicine, and from that writing ophthalmology will not be omitted.

(4) The Equipment of Private Clinics and Hospitals.

This is undoubtedly one of the most striking features of American work. Every successful man has his assistants, his nurse, his stenographer, and his business secretary. He works in a suite of rooms, fitted up for all possible needs, save those of a hospital. An operating room, dark room, a perimeter room, etc., etc., are all included. The arrangements for the estimation of refraction and for other examinations are complete, elaborate, and up to date. In the matter of apparatus and instruments no expense is spared : the latest perimeters, astigmometers, corneal microscopes, electrical ophthalmoscopes, phorometers, and large electro-magnets are to be found nearly everywhere. The underlying assumption is that it pays to have the best of everything. If a man fails to do so, he is outstripped by his friendly rivals and must go to the wall. The American patient "has no use" for the man with an ill-equipped room.

The system whereby paying patients can be taken into the hospitals for treatment or operations is as welcome to the institutions as it is to the surgeons and their patients. In several modern well-equipped and beautiful institutions, the writer was told that the fees obtained from the private wards went a very long way towards supporting the expenses of the whole hospital, in spite of the fact that a large percentage of the beds were free.

A noteworthy factor in the development of American ophthalmology is the foundation of special hospitals devoted to eye cases alone, or to eye and ear cases. The complaint is widespread that the specialist does not receive the treatment he would like in the general hospitals, and all that the writer saw went to bear out the justice of this contention. The result has been a move amongst the eye and ear specialists to establish their own institutions. In the first place, this has frequently been "a venture" on the part of a few men, but in every case it appears to have been more than a success, and it is probable that this system will extend widely in the States. The improvement in the interne and nursing services alone justifies such a movement, apart altogether from the feelings of the surgical staffs of such hospitals, although the latter is a factor which cannot but be reckoned with.

(5) The Number and Quality of the Journals devoted to Ophthalmology.

Probably no nation has so profuse a literature of ophthalmology nor such a large number of societies devoted to the discussion of ophthalmological topics. The demand to know everything that is going on is a leading characteristic of the people generally, and is also expressed in the plethora of specialist journals found in the States. In spite of this, the lay reporter pertinaciously pushes his way into the domain of medicine, and insistently demands in the name of the People (spelt with a big "P") to be informed of anything and everything that, in his judgment, affects the public weal. So difficult has it been found to deal with this evil that in some large towns a compromise has been arrived at, and a medical censor has been appointed through whom alone the better newspapers agree to accept information on medical subjects. This may be criticised by those who only know British conditions, but it is probably more than justified in a country where a reporter when refused an interview has not the slightest hesitation in sitting down to write an imaginary substitute therefor, and in drawing on his imagination for facts or figures for the purpose. Redress there would seem to be none. It is not only the medical man who suffers. The politician is often in a much worse plight. Needless to say, quackery battens on such a system, which although it has the whole weight of medical opinion against it, is yet too strong to be put down, or even to be openly fought.

(6) The catholicity of spirit displayed by American ophthalmologists.

Not only do the successful American eye-surgeons make a point of visiting Europe at least once in every two or three years, with a view to seeing for themselves the changes and improvements that are in progress there, but a number of them travel all over the world for the same purpose. Nor is this all. Freely as they visit other lands, this freedom appears to be as nothing compared with that which they display in dealing with their own countrymen. When it is known that a surgeon has, or thinks he has, a good thing to show, his *confrères* will, without the least hesitation, go and visit him to see his work for themselves, and estimate its value on the spot. Singly or in groups they will start off, assured of a warm welcome on their arrival. They will think nothing of travelling one, two, or more thousand miles, and of leaving their work for the time being in a partner's hands, if, by so doing, they may hope to add to their knowledge and usefulness. There appears to be no jealousy or smallness of spirit in such matters. It is the spirit of a land where "there is bread for all, and to spare."

It is impossible to see something of the ophthalmological work now being done in the United States without being driven to the conclusion that we have here to do with a world-force that is bound to assert itself much more strongly and insistently in the future. The demand for skilled ophthalmologists, backed by the willingness on the part of the patient to meet the cost involved, the establishment of magnificent hospitals, the endowments for research, the restless indomitable spirit of the people, and last, but far from least, the fine quality of so many of the men who have entered the ranks of this speciality—these, one and all, presage great developments. The American will still continue to overrun the world in quest of knowledge, but the greatest development will, I think, be made in his own country; and the man who would know all that is latest and best in ophthalmology, will have in the near future to travel West across the Atlantic to find it. It will once again be the story of the wise men of the East who followed a bright star that rests on a western land—a star as bright as any of those which adorn the brilliant flag of which the nation is so justly proud.

THE OPERATIVE TREATMENT OF CONICAL CORNEA.

BY

P. H. ADAMS, M.A., D.O. (Oxon.), F.R.C.S.

READER IN OPHTHALMOLOGY, UNIVERSITY OF OXFORD, ENGLAND.

Introduction.

THE question of the operative treatment of conical cornea is one to which my attention has been recently drawn by the occurrence of an unusually large number of cases of this disease during the last two years, both in hospital and private practice.

The questions that have to be decided are, first, at what stage should operation be advised, and, secondly, what is the prognosis as regards vision after operation—that is to say, what improvement in sight can one reasonably hope to obtain as the result of surgical interference.

I have not come across any published statistics as to the results obtained in the various procedures recommended, but on looking up the last twenty cases we have had at Oxford, I found that the vision before operation being either <6/60 or 6/60, after operation the vision varied from 6/36 to 6/9, the majority being between 6/18 and 6/12 with correcting glasses. In no case was the vision made worse, but, as a rule, full improvement was not reached until about six months after the operation. Up to this time the glass which gives the best correction varies from week to week. Hence, unless the vision was worse than 6/24 with correction (this being, as a rule, a *plus* cylinder in the neighbourhood of the horizontal axis, as pointed out by Wray, Cooper, Lang, and others), operation did not appear to be indicated.

As regards the operation performed, I always relied on the electro-cautery applied either to the apex of the cone, or just below it, and without perforation of the cornea. Some of the more severe cases had to be cauterised more than once on account of the cone recurring, when the ulcer caused by the burning had healed, and it seemed to me that if the tension of the eye could be kept low during the process of healing, one might get a better result, with less liability to relapse.

The last eight cases I have accordingly treated in the following manner:

First of all, cauterising the cornea at the apex of the cone with the electro-cautery, until the area was well flattened, and then at once proceeding to trephine the eye at the corneo-scleral margin, according to Elliot's method, with the performance of a subsequent small iridectomy. At first I trephined down and in, with the idea of getting a better visual iridectomy, but now, to avoid risk of later dazzling, I have performed this above, as the cone being below the centre of the cornea, the artificial pupil upwards, is more useful for visual purposes, and if dazzling should arise, it would be unconsciously corrected by the upper lid.

The objection to this procedure would, of course, be the risk of subsequent infection spreading through the trephine hole. But to minimise this, I always warn the patients, as also all glaucoma ones, to keep boric lotion handy, and use it at once if any "cold" arises, and to seek advice immediately in the case of styes, etc. Again, in the absence of any raised tension in the eye, subconjunctival filtration does not keep nearly so free in these cases as in glaucoma ones.

Cases.

The cases are as follows :—

(1) Woman, *æt.* 40 years. Well-marked cone in right eye. V. R. 6/60, c. pinhole 6/60, no Jaeger type : + cylinder, no improvement.
March, 1912. R. cornea cauterised, and afterwards vision c. + 1 cyl. ax. 30° = 6/36.
May, 1912. Some cone persisted, so cautery repeated, and trephining done.
Sept., 1912. V. R. 6/36—4 = 6/12, Jaeger iv.

(2) Woman, *æt* 25 years. Well-marked cone in right eye. V. R. 6/60.
March, 1912. Cautery and trephining with visual iridectomy.
May, 1912. V. R. 6/12 iii. + 2 cyl. ax. 75° = 6/9 iv. and Jaeger 1.
August, 1912. V. R. 6/9 v. J. i.
October, 1912. V. R. 6/9 + 0·5 cyl. ax. 30° 6/9.

(3) Man, *æt.* 22 years. The worst case I have seen. It was almost a central staphyloma, the cone being so marked that the bulging could be seen through the lid when closed. V. L. = hand movements at 2 feet.

The left eye was cauterised twice and still some conicity remained. Then cautery was repeated and trephining with visual iridectomy was done in March, 1912.
June, 1912. V. L. c. slit axis 100° = 6/18 ii.
February, 1913. V. L. 6/24.
September, 1913. V. L. 6/24. Cornea keeping nicely curved.

(4) Woman, *æt.* 36 years.
V. L. 6/60 with pinhole 6/24.

Left eye was trephined, but with no improvement in the cone.
November, 1912. Cone cauterised.
January, 1913. V. R. 6/36.
April, 1913. V. R. 6/24 + 3 cyl. ax. 180° = 6/18.
July, 1913. V. R. 6/24 + 3 cyl. ax. 180° = 6/18.

(5) Woman, *æt.* 37 years, with well-marked cones in each eye and suffering from severe Graves' disease—V. R. 6/60 L. 6/60. Left eye was cauterised twice, and visual iridectomy done. Right eye was cauterised twice, but each time the cone recurred Then cauterised and trephined, V. R. 6/60 - 2 = 6/36. L. 6/60. No further development of cone.

(6) Woman, *æt.* 27 years, marked cone in each eye, although in left eye well below the centre of the cornea. September, 1912.—V. R. 6/60 + Jaeger x. V. L. 6/18 iii. Jaeger iv.

Right eye was cauterised but perforated three days later, but healed in ten days without event.

Left eye, cone cauterised and trephined with iridectomy as the V. deteriorated. March, 1913.—V. R. 6/18 + 3 cyl. axis 180° = 6/12. V. L. 6/24 + 4 cyl. ax. 180° = 6/12 ii.

(7) Girl, *æt.* 16 years. Well-marked cone in left eye. May, 1913.—R.V. 6/9 + 2·5 D. cyl. ax. 180° = 6/6. L.V. 6/60 + 1·0 D. sph. with + 1·5 D. cyl. ax. 15° = 6/60. June, 1913.—L.E. cauterised, and trephined with iridectomy. January, 1914.—L.V. 6/60 + 2.5 D. sph. with + 5 D. cyl. ax. 110° = 6/12.

(8) Woman, *æt.* 35 years, operation performed a month ago, but already patient states that sight has improved.

Comments.

I do not suggest that all cases of conical cornea which require operation should necessarily be trephined. But I regard trephining as a useful procedure in severe cases, especially likely to appeal to those who look on perforation of the cornea as an undesirable occurrence, and while we are still in ignorance of the actual cause of the condition, it is reasonable to suppose that the weakened corneal tissue has been unable to withstand the normal intra-ocular pressure and consequently bulges. By means of the above operation, one not only replaces the weakened and yielding corneal tissue by a firm scar, but at the same time ensures that this scar shall have every opportunity of solidifying under the most favourable conditions.

STUDIES ON THE NATURE AND TREATMENT OF PTERYGIA.*

BY

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IN the hope of obtaining a wider field of observation on the subject of pterygia than would be possible from a study of the literature hitherto published, I recently addressed a communication to one hundred of the leading ophthalmologists of America, requesting their views on fourteen questions relative to the nature and management of this affection. The fourteen questions I herewith present, but, as many of the letters in reply are rather voluminous, I will not dare to intrude upon your valuable time by reading them in detail, but will limit my paper to a brief expression of those convictions which I entertain not only as a result of this series of investigations but as the logical sequence of my own personal experience.

I deeply appreciate the cordial co-operation of my *confrères* in the task of ascertaining the true attitude of American ophthalmology on this interesting theme, and if time would allow, I should be glad to read in full these communications, in order that we might appreciate the influence of climate and environment on the primary development of the growth, the opposing views as to the causation and pathology, and the various measures which at different times have been employed for its relief. In estimating the weight of the experience of different observers we must consider, not alone the skill and general equipment of the surgeon, but also the influence of climate in the production of the disease. For example, one of the leading ophthalmic surgeons of London told me that he was confident that he had not operated for pterygium in private practice more than half-a-dozen times during his entire career, one of unusual and extended activity. In visiting the various clinics of America and of Europe during the past twenty years, I have frequently been struck with the limited number of such cases as compared with the number in some other parts of the world. And as the same conditions which tend to produce the growth in the first place will also favour recurrence after operation, we can understand that a method which would yield entirely satisfactory results in one locality might utterly fail in another.

The questions which have formed the basis of my study are as follow :—

1. Approximately, what proportion of your ophthalmic patients are affected with pterygia?
2. What is your view of the causation of pterygia?
3. What has been your observation with regard to the influence of age, sex, climate, and occupation on the primary production or recurrence of the growth?
4. What relation do you discover between pinguecula and pterygium?
5. What relation do you discover between corneal ulceration and pterygium?
6. What is your view of the pathology of pterygium?
7. From what different directions have you observed the growth advancing over the cornea?
8. To what extent have you observed the cornea covered by pterygia?
9. What effect on vision have you observed other than that produced by obstruction of light?

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* Read before the Oxford Ophthalmolgical Congress on July 17th, 1913.

10. Have you observed any effect on the motility of the eyeballs before operation and after operation?

11. Have you observed a cure from any treatment other than operative?

12. What methods of operating have you employed, and with what results?

13. If the method which you generally employ is satisfactory, state the special advantages of the same?

14. If the method which you generally employ is not satisfactory, state the objections which you have encountered?

Before proceeding to a discussion of the treatment of pterygium it would be well to consider the nature of the growth and the circumstances under which it develops.

So eminent an authority as Prof. Fuchs speaks of pterygium as a growth peculiar to those past middle life, and while this may be true of Vienna and the country surrounding that city, it certainly is not true of the south-western part of the United States, where I have been practising ophthalmology for a number of years. In this region, where we have the combination of summer heat from April to November, with a dry atmosphere agitated by high winds and impregnated with dust, we will find ideal conditions for the development of pterygia. Consequently, it is not at all infrequent to meet with boys in that country afflicted with pterygia of small size, while among those who are older, we see pterygia growing from both the inner and the outer canthus until they practically cover the entire cornea, and reduce vision to the dim perception of large objects. This tendency to pterygium is by no means the same throughout the region of the southwest, but is found especially in those districts where the conditions mentioned above are so abundantly supplied. In the south-west, embracing that territory lying between the Mississippi river and the Pacific Ocean and between the Gulf of Mexico and the Mexican Republic on the south, and the continuation of Mason and Dixon's line on the north, we have a vast variety of climates and of soils, and it has been my observation that patients coming from the still, warm, humid regions of the south are not so frequently nor so seriously affected with pterygium as are those coming from the warm, dry, windy, and dusty regions of the same latitude. Heat, a dry atmosphere, and high winds will cause the maximum degree of evaporation of moisture from any surface, and the combined influence will be felt upon any exposed mucous membrane. When these factors are exerted almost continuously on the structures in the palpebral opening for many years and are reinforced by enormous quantities of alkaline dust, which clings to the eyeball about the sclero-corneal junction and the inner canthus, and the outer canthus, and is not wiped away by the motion of the lids, but rather heaped up in the axis of the palpebral fissure, and when the evaporation of the tears is so rapid that they do not accumulate in sufficient quantity to wash away the foreign particles accumulating on the globe, then we have conditions most favourable for the development of pterygia, as experience has shown. Further, not only do we observe the difference in liability to pterygia among the inhabitants of different localities, but in any given locality pterygia will be far more frequent and much more severe among those who are exposed to the irritating effects of direct sunlight and of wind and dust. Thus, I find that I have many more cases of pterygia among ranchmen and farmers than among women and men of sedentary occupations, although the latter class will apply much earlier for relief on cosmetic grounds.

I conclude, then, from my experience, that pterygia are produced by the prolonged irritating action of several factors, chief among which are heat, a dry atmosphere, high winds, exposure to sunlight, and an abundance of dust, especially if alkaline in character.

Then, with these facts of causation before us, we must recognise that an important part of the post-operative treatment will consist in the removal, as far as possible, of those conditions which favour the development of the growth in the beginning. We must recognize that a pterygium that would be harmless in New York or London or Vienna, might prove distinctly injurious on the plains of Western Texas or New Mexico. We must further recognize that a method of operation which would yield satisfactory results in New York, or London, or Vienna, might not succeed to the same degree on the plains of the far south-west.

All forms of simple abscission which require a break in the conjunctiva along the axis of the palpebral fissure, must be more or less unsatisfactory, because this will demand one or more sutures, bringing the divided parts in apposition, and the line of union is apt to be associated with some thickening of the tissues and seldom is altogether as smooth as the normal conjunctiva, and the irritation consequent upon these conditions will serve to invite the neighbouring sub-conjunctival vessels and thus cause a return of the growth in many cases. In my own experience, among a people who are afflicted with pterygium as frequently as the inhabitants of any part of the world, I must say that my results have been far more satisfactory with the method of transplantation than with any method of abscission. But the exact way in which this transplantation is accomplished has much to do with the success of the operation, and after a very thorough trial of the various procedures along this line, I have finally adopted a plan which has seldom disappointed me within the last few years. It is a modification of the old operation originally devised by Desmarres, but it differs in some very important features from that operation, and these differences constitute the most important elements of its value.

In order that I may clearly contrast this operation with that devised by Desmarres and described by him in the second edition of his "*Traité Théorique et Pratique des Maladies des Yeux*," I append an extract from Shoemaker's chapter in Casey A. Wood's "*System of Ophthalmic Operations*," 1911, Vol. I, p. 874.

"**Desmarres' Method of Transplantation.**—By this, the first practised transplantation method, the pterygium is separated from the cornea and its bed, back to its base. The tip is then transferred into a prepared angle or pocket in the lower fornix of the conjunctiva. After dissecting up the pterygium in the usual manner until it remains attached only at its base, an incision is carried downward toward the fornix through the conjunctiva, starting a few millimetres from the corneal margin. Into this denuded angle thus formed the head of the pterygium is fastened with a single stitch. Desmarres made no attempt to cover in the exposed sclera, but allowed the wound to heal by granulation. The operation was only described to show the origin of the transplantation method. It should not be performed to-day as Desmarres did it, as no surgeon would leave wounds to granulate that could just as well be covered. Important modifications, however, devised by Knapp and McReynolds, have made from this operative principle very effective methods of disposing of pterygium.

"**Knapp's Operation.**—Knapp describes his method as double transplantation and covering the defect with conjunctival flaps. The *technique* of the operation, following closely the author's own description, is as follows:—Remove the head from the cornea. Incisions made with small curved scissors are then carried along the lower and upper margins of the pterygium towards its insertion into the semi-lunar fold, and prolonged into the lower and upper fornix respectively. The pterygium is then detached from the sclerotic and the head cut off. With a pair of straight scissors the pterygium is then split into two symmetrical halves by a horizontal incision. The tip of the lower half is then stitched into the apex of the triangular defect in the lower conjunctival fornix and the tip of the upper half is likewise stitched into the upper conjunctival fornix. To cover the defect Knapp makes two accommodation incisions, then introduces two stitches—one next to the limbus, and the other at the caruncular end of the defect. The latter stitch should include the tissue forming the apex of the angle behind the two halves of the split pterygium."

McReynold's Operation.

The details of the operation are the following:—(1) Grasp completely the neck of the pterygium with strong but narrow fixation forceps. (2) Pass a Graefe knife through the constriction and as close to the globe as possible, and then with the cutting edge turned towards the cornea, shave off every particle of the growth smoothly from the cornea. (3) With the fixation forceps still hold the pterygium, and with slender straight scissors divide the conjunctiva and subconjunctival tissue along the lower margin of the pterygium commencing at its neck and extending towards the canthus a distance of one-fourth to one-half of an inch. (4) Still hold the pterygium with the forceps and separate the body of the growth from the sclera with any small non-cutting instrument. (5) Now separate well from the sclera the conjunctiva lying below the oblique incision made with the scissors. (6) Take black silk thread armed at each end with small curved needles and carry both of these needles through the apex of the pterygium from within outwards and separated from each other by a sufficient amount of the growth to secure a firm hold. (7) Then carry these needles downward beneath the loosened conjunctiva lying below the oblique incision made by the scissors. The needles, after passing in parallel directions beneath the loosened lower segment of the conjunctiva until they reach the region of the lower fornix, should then emerge from beneath the conjunctiva at a distance of about one-eighth of an inch from each other. (8) Now, with the forceps lift up the loosened lower segment of conjunctiva and gently exert traction upon the free ends of the threads which have emerged from below, and the pterygium will glide

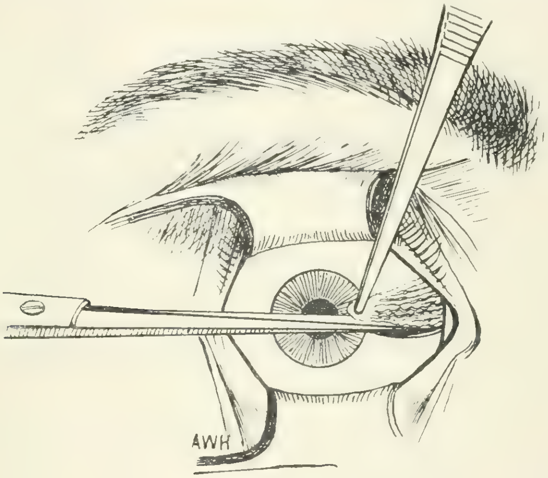

FIG. 1.

beneath the loosened lower segment of the conjunctiva, and the threads may then be tightened and tied and the surplus portions of thread cut off, leaving enough to facilitate the removal of the threads after proper union has occurred.

It is very important that no incision should be made along the upper border of the pterygium, because it would gape and leave a denuded space when downward traction is made upon the pterygium. On the contrary, the elasticity of the conjunctiva is such that when this downward traction is exerted upon the head of the pterygium the conjunctiva becomes thinned out, and smoothly applied to the sclera corresponding to the former site of the body of the growth, and the margin of the conjunctiva coincides accurately with the sclero-corneal junction. Thus, when the operation is completed and the speculum removed, no stitch is seen, because it is hidden by the lower lid; the only denuded area is on the cornea. The former site of the body of the pterygium is covered by a thin and comparatively non-vascular conjunctiva, and what blood vessels remain are directed downward and not horizontally, and hence do not tend to encroach again upon the cornea. In fact, the whole vascular activity is concentrated beneath the lower lid, where it is not only removed from view, but protected from the irritating influences of dust and exposure, and the process of atrophy naturally and surely follows. In the meantime, the corneal wound heals quickly and the thin conjunctival tissue becomes closely adherent to the sclera in the palpebral opening. After a few days the single stitch can be removed, and the old pterygium will be found firmly adherent to the sclera and hidden beneath the loosened lower segment of conjunctiva. If the head of the pterygium is very large it may be cut off before the growth is drawn down beneath the loosened lower segment of the conjunctiva.

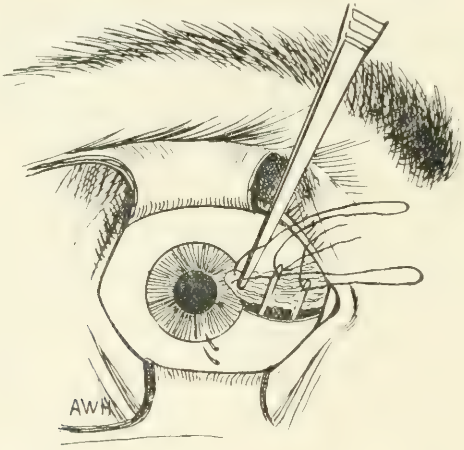

FIG. 2.

The general direction of the traction threads is vertical, but usually it is best to incline them in such a way that they will emerge from that part of the conjunctiva which lies below the cornea. This may be necessary many times, in order that all of the denuded sclera may be completely covered by smooth conjunctiva, and if the conjunctiva should slightly overlap the cornea at any point, it can easily be trimmed smoothly away without interfering with the desired result. If the head of the growth is very large, so that it covers something like a third of the cornea, and if the body is also very thick and fleshy, it may be best to dissect away the head from the cornea with a sharp knife, and then remove with scissors a part of the head and a part of the subconjunctival portion of the body of the growth, and then deal with the rest of the pterygium, according to the method already described.

While we have already outlined the salient features in the operation for the usual types of pterygia encountered, still there are many additional points, the recognition of which will lead to a higher percentage of perfect results, and as a supplement to the preceding, it might be helpful to explain more fully the details and *rationale* of the various steps of the operation which experience has shown to be worthy of attention.

i. **The preparation of the eye.**

Of course, as in all other ophthalmic operations, it is desirable to have, as far as possible, a clean field of operation, and yet I have never seen infection, even in cases in which a distinct conjunctival involvement was present at the time of operation. One would certainly not prefer to undertake any kind of surgical procedure in the presence of an acute purulent conjunctivitis, but a low grade of chronic conjunctivitis with slight secretion, the complete cure of which would be retarded by the existence of the pterygium, would not offer a valid objection to the removal of the growth. In cases of this latter kind, reasonable safety would be secured by flushing the conjunctival sac with a 10 per cent. solution of argyrol and then following this with free irrigation with any mild non-irritating antiseptic solution. In ordinary cases complete anæsthesia can easily be obtained by instillations of 5 per cent. cocaine solution. But when the growth is very thick and fleshy, the so-called pterygium crassum, I invariably apply a few crystals of cocaine hydrochloride directly to the head and neck of the pterygium, and this procedure ensures absolutely perfect anæsthesia, so that there will be no delay in the successful performance of every detail of importance.

With reference to agents employed in advance to control hæmorrhage at the time of operation, I will say that the judicious use of adrenalin chloride can do no harm in any case, but personally I reserve this for the more vascular forms of pterygia. Of course, it may be said that the action of adrenalin chloride will render less distinct the outlines of the growth and thus interfere with the accuracy of the procedure; and while this in a measure may be true, still I am convinced that if the operator possesses good sight and a true hand, he will always be able to remove completely every vestige of the growth. On the contrary, there are some elements of value in adrenalin chloride in addition to its power of controlling hæmorrhage. For when the pterygium is very broad and very fleshy it so largely conceals the knife transfixing the growth that you may not be able to gauge properly the depth of your corneal incision. Now the action of adrenalin will increase the transparency of the growth and enable one more definitely to determine the situation of the advancing knife.

ii. **The removal of the growth.**

Grasp the neck of the pterygium firmly with strong but narrow fixation forceps, thus lifting the growth freely from the underlying sclera. The forceps which I now employ for this purpose I have devised so that with the narrow extremity the growth is securely held while the flattened serrated segment adjacent to the point can subsequently be used as a needle holder, thus reducing the number of instruments required in the operation. The forceps should not be provided with a lock, as the operation of the lock would be wholly unnecessary and would contribute nothing to the speed, facility, or accuracy of the procedure. Originally, I advised that while the growth is being held by the fixation forceps, a Graefe knife, with its cutting edge directed towards the cornea, should be made to transfix the neck of the pterygium and then to shave off every particle of the growth from its corneal attachment. I must still say that in the majority of cases the Graefe knife supplies every indication, but it sometimes happens that a very projecting brow or a very broad pterygium would present difficulties in the way of manipulating a Graefe knife at right angles to the interpalpebral fissure. To obviate this difficulty, I have employed a special pterygium knife, which is essentially a narrow short-bladed double-edged keratome, placed at an angle of 135 degrees with the axis of the handle—in reality a very narrow angular keratome. This instrument enables the operator by standing at the head of the patient to introduce the knife with equal facility on either side of either eye, and also to cut in any desired direction without changing the relation of patient and surgeon. It is essential that the knife be very narrow, so that it can transfix the neck of the growth without first cutting laterally to any marked extent. Then when the point has well emerged from beneath the neck of the pterygium, the knife can be made to shave off every particle of the growth from its corneal attachment. In this connection I cannot emphasize too strongly the absolute necessity of the complete removal of the growth from the cornea. I have repeatedly demonstrated that in a given pterygium, if a portion of the head is radically removed and a portion is imperfectly removed, the tendency to recurrence is manifested in far greater degree in that part corresponding to the incomplete removal. Now, the pathology of pterygia clearly proves that the growth, if fully developed, involves not only the epithelial layer and Bowman's membrane, but also the superficial lamellæ of the corneal stroma. Moreover, as stated above, experience has abundantly shown that any procedure which fails to include every vestige of this abnormal corneal involvement must also fail to secure the nearest approach to a perfect result with the minimum tendency toward a recurrence. Hence it is that all forms of divulsion and ablation by means of dull instruments must fall short of the highest efficiency, because they necessarily fail to reach the basal layers of the corneal invasion, and they leave a surface better adapted to the return of the growth. I do not mean to say that splendid results have not been attained by divulsion, for I have many times successfully employed this method myself, but I am thoroughly convinced that such a procedure, while it may yield excellent results in some localities, cannot stand the test of a comparison under atmospheric conditions that strongly favour the development of pterygia. In other words, in some localities almost any method will succeed, while in others a successful result will exact more careful attention to every detail of thoroughness and every element of safety. Since a radical removal of the head is a matter of great importance, it is essential to the highest efficiency that the pterygium knife should be as sharp as possible, both in its point and in its cutting edge. In fact, I have found it useful to guard with as much care the keenness of a pterygium blade as I would that of a cataract knife. In very broad and fleshy pterygia, the usual plan of transfixion and subsequently ablation, as described above, must be modified in accordance with the area involved. Suppose, for instance, a pterygium covers one-third of the cornea with a dense vascular mass, and you transfix the neck with an instrument having a straight cutting edge like a Graefe cataract knife: when the knife advances over the cornea from the neck to the apex its area of cleavage, or track, or path is not the surface of a sphere with the normal corneal curvature at all times equally distant from the membrane of Descemet, but its path is in a single plane, cutting off a segment of a sphere whose periphery involves only the most superficial layers of the cornea, while its centre may involve the entire thickness of the cornea. In such cases the head of the growth must be dissected away from the cornea very thoroughly but very carefully, and the success of this procedure will depend in large measure upon the sharpness of the instrument employed and the facility with which it may be made to change its direction in accordance with the curvature of the cornea, thus permitting the operator gently to insinuate the blade of the knife between the affected superficial lamellæ and the normal deeper lamellæ. It is important also to remember that this process of complete removal must extend to the neck of the growth as it passes over the limbus. The separation of the body of the growth from the underlying sclera, to which it is always very loosely attached, except in cases that have been unsuccessfully operated upon, may be accomplished by a variety of instruments. I generally employ for this purpose the point of the *closed* Stevens' strabismus scissors, which is useful also in undermining the conjunctiva above the pterygium, and in making the subsequent oblique incision along the lower border of the pterygium, and in undermining the conjunctiva below this oblique incision, and also in removing, when necessary, any portion of the growth or of the vascular subconjunctival tissue beneath it. It sometimes happens that the head or the body of the growth may be so large and bulky that it is unnecessary, for the smooth performance of the operation, to preserve every portion of this growth in transplanting, and so I am in the habit of cutting away in such cases the superfluous tissue. But it is essential that this cutting-away process should be confined to the horny portion of the head, the lower margin of the body, and the vascular subconjunctival tissue, always preserving intact the superior margins of the pterygium, in order that we may be able to utilise to the fullest extent the elasticity of the unbroken conjunctiva above the growth, in covering smoothly the denuded area of the sclera when downward traction is made upon the head of the pterygium.

In order that the pterygium may easily and freely glide downwards when traction is exerted upon it, we must be careful to undermine the conjunctiva thoroughly above the growth, and especially must we ascertain that all conjunctival fibres in the immediate vicinity of the neck shall be freed from their attachments at the limbus. The exact position of the oblique incision along the lower border of the growth would necessarily vary with the breadth of the growth, and in no case should this incision encroach upon the pterygium either in its body or at its neck; and no harm would result, but greater safety be secured by allowing a margin of one millimeter between the lower border of the growth and this oblique incision.

iii. The Sutures.

I have tried all forms of suture material, and that which has been most satisfactory has been fine black silk thread, although absorbable suture, if sufficiently fine, will give perfect results. I formerly allowed the stitch to remain four days, but I have found that sufficient adhesions will frequently occur within two or three days, and this is a matter of some moment to patients who live at a distance and who would prefer to remain away from home under the direct care of the oculist only until the stitch had been removed. I still find it preferable to employ a thread armed at both ends with small curved needles, and this smallness of the needles is of some consequence where we are dealing with cases of a fragile conjunctiva. I have closely compared the case, in which the needles were inserted into the head from without inwards with the cases in which the needles were inserted from within outwards, but I have not been able to discover any marked difference in the results. The direction of the two threads as they pass almost parallel beneath the loosened lower segment of the conjunctiva may vary somewhat according to the elasticity of the conjunctiva and the scleral area to be covered by the attenuated conjunctiva from above the growth. Generally, they will emerge near each other in the region of the lower fornix under the centre of the cornea, but these positions may be modified slightly according to the denuded area to be covered and the degree of traction which is exerted upon the threads. The essential object to be attained is so to direct the threads and so to regulate their tension that the normal conjunctiva above the growth shall be made to curve accurately around the denuded limbus without encroaching upon the cornea or without leaving any portion of the sclera uncovered. If the calculations have not been perfectly accurate and you find some overlapping of the cornea, the needles should either be introduced again or the overlapping conjunctiva should be very carefully trimmed away along the line of the limbus. After the tying of the threads has arrested the insignificant oozing which may sometimes occur, it is well carefully to inspect the field and especially to ascertain if every vestige of the growth has been removed from the cornea. If it has not been thoroughly removed, the corneal wound will not reveal a transparent stroma, but will show a certain degree of vascularity or opacity which will indicate the necessity of further attention. Then we can again resort to a perfectly sharp pterygium knife and shave off every particle of the pathological tissue, leaving a smooth surface over a transparent cornea.

Practically, the only discomfort to be apprehended will be in the first few hours succeeding the operation, and this can be effectually relieved by cold applications and the occasional instillation of a weak anæsthetic solution. A light bandage should be worn for a few days and the patient instructed to avoid as far as possible those conditions which have a tendency to favour the development primarily of this affection. All errors of refraction, especially the astigmia usually present, should be corrected, and appropriate treatment instituted for any kind of ocular disease which may exist at the time.

Inasmuch as a pterygium may require removal in the later decades of life, when the patient may present some tendency toward glaucoma, I have sometimes felt that it was prudent to instil a few drops of pilocarpine solution after the operation. My attention was first directed to this by a patient who came to me absolutely blind from acute glaucoma that had supervened immediately upon a rather protracted operation for extensive pterygium in the hands of a very competent and experienced *confrère.*

METASTATIC GONORRHŒAL CONJUNCTIVITIS WITH KERATITIS AND IRITIS: TWO CASES.

BY

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Introduction.

THE recognition of gonorrhœal affections of the eye in the earliest days of medicine is shown by the crude methods adopted by the ancients for the prevention of ophthalmia neonatorum. The latter was attributed to causes as diverse as the mother's milk and a disordered state of the bowels. It was not until 1750 that the definite relation between leucorrhœa in the mother and ophthalmia in the baby was recognised. Wide differences of opinion existed until 1879, when Neisser announced his discovery of the gonococcus. The relation of the ophthalmia of adults to gonorrhœa was also very slowly appreciated.

Long before one knew of the gonococcus, and the relation between this micro-organism and purulent ophthalmia, there was a well established belief in the internal route of the virus. The retropulsion idea may have had some influence here. It was believed that the gonorrhœal virus, because of stoppage in one direction, sought means of escape in another, so that medical men looked with apprehension on an early cessation of the discharge. This theory of the internal route, or the endogenous origin of gonorrhœal affections of the eye, dominated all others for many years. In 1736, Astruc reported a case of purulent conjunctivitis, which he attributed to direct infection from the urethra; and, in 1750, Quellmetz insisted upon the definite relationship between leucorrhœa in the mother and ophthalmia in the baby. Nevertheless, the endogenous theory held sway until Piringer's experiments finally settled the question.

Now, all gonorrhœal affections of the conjunctiva were held to be due to direct inoculation. The pendulum seems to have been at one extreme or the other. In 1818, Brodie reported a number of instances of metastatic conjunctivitis and iritis occurring in association with gonorrhœal rheumatism. In 1825, Abernethy noted the relationship of metastatic ophthalmia to rheumatism and urethral discharge. In 1850, 1851, and 1860, Larsen and Bergh respectively drew attention to endogenous gonorrhœal conjunctivitis. Fournier, in 1866, described a type of conjunctivitis occurring in a case of gonorrhœa, with inflammation of the joints, which he regarded as metastatic. In 1881, Haab reported a bilateral conjunctivitis which he did not think was due to direct infection, because of the absence of gonococci from the conjunctival secretion. Haltenhoff, in 1887, drew attention to the fact that metastatic cases occur principally in men. Van der Straeten pointed out that the metastatic could be distinguished from the exogenous infection by the absence of gonococci; and Peters and Gieler, in their address in 1897, noted that recurrences of the conjunctivitis might take place without any renewal of the joint changes. In 1907, Carrol published an article reporting two cases of metastatic conjunctivitis in full, and added to his article a most complete bibliography. He ends his article as follows:—

"It may be suggested, as a fair hypothesis, in the light of our present knowledge, that while it is possible, as maintained by Morax thirteen years ago, for a few cases of metastatic conjunctivitis to be caused by the gonococcus in the conjunctival sac, it is probable that the essential agent in the great majority of cases is not the gonococcus acting on the ocular mucosa, but a specific poisonous product of this organism called its toxine."

In the *Ophthalmic Record* of December, 1908, Stieren reported three cases of metastatic gonorrhœal conjunctivitis, and one of arthritis, following ophthalmia neonatorum. In the discussion which followed, W. Reber remarked that he had seen two cases of such conjunctivitis and one of iritis. Posey stated that metastatic inflammation may be occasioned either by the gonococci themselves circulating in the blood, and forming emboli in the minute vessels of the eye, or through the medium of a gono-toxine which has been described by various authors.

In 1909, the writer reported a case of metastatic gonorrhœal conjunctivitis from which the gonococcus was demonstrated in smear and culture. Sidler-Huguenin, of Zürich, last year reported some very interesting observations on metastatic ophthalmia. There were fourteen cases, twelve of which were of gonorrhœal origin. In five of the twelve cases, gonococci were found in the blood, and in one case he cultivated gonococci from the aqueous in pure culture. That gonococci are the active agents in some of these cases, at least, was shown by the fact that Sidler-Huguenin found gonococci, or Gram-negative diplococci, in a piece of conjunctival tissue.

Pincus last year reported two cases of endogenous gonorrhœal keratitis. He refers to Elschnig's opinion which is, if the proved cases only were accepted, that metastatic affections of the eye would be found to belong to the greatest of rarities. In a metastatic gonorrhœal case, Pincus believes it should be definitely shown that the infection is a gonorrhœal one, by the demonstration of the gonococcus ; that the local disease should be coincident with the systemic disease ; and, lastly, that the examination of the secretion in conjunctivitis cases should prove negative.

Every case of catarrhal conjunctivitis occurring in an individual with chronic gonorrhœa, or even systemic gonorrhœa, is not a metastatic one. Careful bacteriological examination is necessary, and if Gram-negative bacteria are found, careful differentiation. A young adult male was referred to me by Dr. C. C. Gurd for a catarrhal conjunctivitis of both eyes which had occurred during the course of a chronic gonorrhœa. Upon examining the patient, it was thought at first that the conjunctivitis was a metastatic one. The non-involvement of the anterior conjunctival vessels was very prettily shown. However, when the secretion was examined, it was found the infection was a diplobacillary one, which cleared up very quickly under zinc. A similar case was referred to me by Dr. R. P. Campbell. The conjunctivitis had the appearance of a metastatic one, but the bacteriological examination in this case, too, demonstrated the diplobacillus.

Cases.

1. C. B.——, an adult male, aged 24 years, was referred to me by Dr. R. P. Campbell for an acute inflammation in both eyes. He gave the following history.—Three weeks previously he had been exposed to infection, followed three days later by an acute urethritis. One week later he awakened one morning to find both his eyes inflamed ; the lids were adherent, and during the day there was free discharge. This continued for three days, when he came to consultation, August 9th, 1909. He complained, too, that his knees were painful and swollen, so that he was sent into the medical side of the hospital.

Present condition.—The patient has in each eye a severe purulent conjunctivitis. The discharge is profuse, and the conjunctival congestion marked. The absence of injection at the corneo-scleral margin is very noticeable. The upper lids are swollen. Both knees are œdematous and painful. He has a gonorrhœal urethritis. It was thought that the conjunctivitis was a metastatic one, so irrigations with boric acid lotion were ordered three times daily. The conjunctivitis ran a mild course, and one week later the conjunctivæ were noted as normal. During the next two weeks there were two mild recurrent attacks. The rheumatism ran a protracted course, and kept him in bed for six weeks.

Bacteriology.—Smears were made from the conjunctival discharge, and stained by Gram's method and with methylene blue. Here and there, intra- and extra-cellular, were found Gram-negative diplococci, but nowhere as plentiful as one finds them in the exogenous form of infection. The slides stained with methylene blue demonstrated the biscuit shape of the organisms very well. Media, consisting of blood-serum, hæmoglobin-agar, and plain agar, were inoculated. The hæmoglobin-agar gave a growth of profusely scattered large round white colonies between which were some smaller colourless ones. Examination showed these to be large Gram-positive cocci and small Gram-negative diplococci. The attempt to isolate the Gram-negative diplococcus was unsuccessful, because the large coccus grew so profusely.

The patient came to see me again in November. His left eye had been inflamed and painful for two weeks, and during the last day or two the pain was severe. Upon examination, he was found to have a well-marked iritis in each eye. We decided to try a vaccine, and on November 25th he received from Dr. Campbell an injection of 15 millions. For the next two days there was a very decided improvement, followed two days later by an equally decided reaction. On December 3rd he received another injection of 15 millions. This was followed by a similar improvement and relapse; the latter was so severe that it was decided to send him into the hospital again. Rest in bed, hot fomentations, and hot baths improved his condition, so that he was able to leave the hospital on the 23rd December.

One week later he complained of pain in the left eye. There was photophobia and profuse lacrymation, which had begun two days previously. There was marked ciliary injection and in the lower third of the cornea a V-shaped infiltration which faded to both sides. With rest in bed, hot fomentations, and atropine, he made rapid progress. The patient was still suffering from rheumatism in both knees but was well enough on January 22nd to leave the hospital.

The patient's previous history is interesting in this respect, that during the previous year he had been in the hospital with systemic gonorrhœa and during that attack had a metastatic conjunctivitis and scleritis. He had had a chronic gonorrhœa for a year when rheumatism and inflammation of the eyes set in, simultaneously with the cessation of the urethral discharge. He was treated for five days in the ophthalmic wards at that time and then sent to the medical side.

2. On June 2nd, 1910, I was asked to see a ward case, J. H., male, of 39 years, who was confined to bed with an active gonorrhœal urethritis, complicated by arthritis and pericarditis. Upon examination, it was found that the patient had a severe conjunctivitis on the right side with purulent discharge. Two days later the left eye became involved. Exposure four months previously was followed by a urethritis, and an arthritis in the left knee, ankle, and hand.

The treatment consisted in irrigations with solutions of boric acid, which caused the conjunctivitis to clear up in a few days. Examination of the conjunctival discharge by smear and culture proved entirely negative. Examination of the urethral discharge by Dr. MacCordick demonstrated many Gram-negative diplococci.

Ten days later it was necessary to see the patient again because of photophobia and pain in the eyes. The conjunctivæ were normal, but in each cornea there were grouped points of infiltration. This was followed, two days later, by a very definite iritis in each eye, with posterior synechiæ on the left side. With atropine and hot fomentations, the corneal condition cleared up quickly. The iritis gradually subsided, so that the patient was able to leave the Hospital on July 9th.

CLINICAL MEMORANDUM.

A CASE OF PRIMARY EPIBULBAR LEUCOSARCOMA.

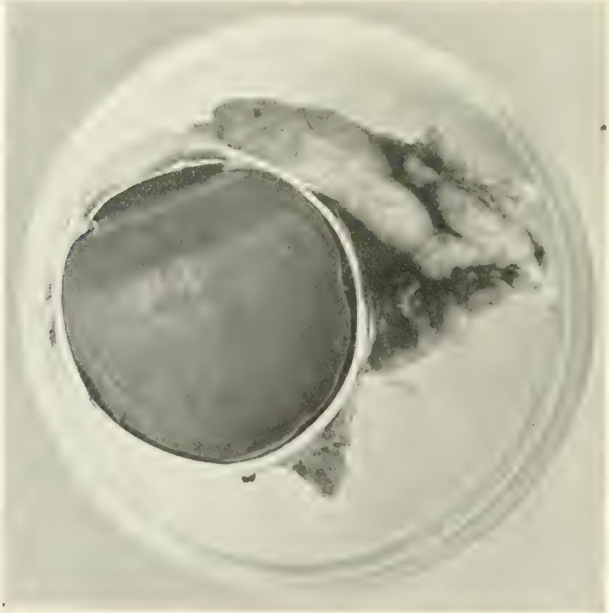
BY

R. H. DICKSON,

NEWCASTLE, STAFFS., ENGLAND.

Case.

I. L., a shoemaker, aged 77 years, came as an out-patient to the North Staffordshire Infirmary in November, 1904. On the right eye there was a large purple-coloured fleshy episcleral growth completely surrounding the upper half of the cornea, extending from the corneal margin back as far as could be seen.



The growth was firmly adherent to the underlying sclerotic, as well as to the conjunctiva covering it. The lens showed signs of incipient cataract, but the fundus could be seen fairly well, and appeared normal. V.=6/24. The patient stated that he had first noticed the growth five years before, as a small nodule on the outer side of the cornea. It had gradually increased in size, and spread round the upper half of the cornea. There was no history of injury. At times he suffered from some pain in the growth, but, as a rule, there was little or no discomfort.

A piece of the tumour was excised, and forwarded to a pathological institute for examination. It was reported to be simple granulation tissue.

In the left eye was a mature cataract, which was successfully operated upon, the eye being in other respects normal.

In May, 1905, the man again presented himself at the Infirmary. The tumour on the right eye had considerably increased in size. It now presented the appearance of a large dark purple-coloured fleshy episcleral mass encircling the upper half of the cornea. It was thickest above, where it overlapped the corneal margin, and extended as far back as could be seen when the eye was rotated downwards. It was of firm consistence, closely adherent to the sclera and to the conjunctiva covering it. The cornea was clear ; the conjunctiva slightly hyperæmic ; the lens opaque. The lids could still be closed without difficulty. The vision was now reduced to perception of light ; the pupil acted normally to light and to accommodation ; and the projection was good. The ocular movements were unrestricted except perhaps in the upward direction.

A further portion of the growth was excised, and sent for examination to Mr. W. H. McMullen, who reported that it was a small round-celled sarcoma, and advised enucleation.

On June 1st, 1905, the patient was admitted to hospital, and the following Sunday, June 4th, the eye and the growth were excised *en masse*, and immediately put into a 10 per cent. solution of formalin.

The patient was seen on November 4th, 1905. He looked in all respects the picture of health. There was no sign of any local recurrence of the growth, and careful examination showed lungs, liver, spleen, and kidneys, to be in all respects normal. He died on November 24th, 1910, from natural causes. There was no recurrence of the growth.

Report and Note by Mr. W. H. McMullen.

Macroscopical Appearances.—There was a large flat growth encircling the upper half of the cornea, closely adherent to the sclerotic from the margin of the cornea as far back as the insertions of the recti muscles. The growth was thickest and broadest above where it extended back about 30 mm. from the limbus. The greater part of the posterior portion was superficial to the superior rectus muscle, but it had also extended to a slight extent between the tendon and the globe, sc that the insertion of the muscle was completely surrounded by growth. This posterior portion was deeply lobulated, the limit of the lobules being well-defined. On either side the growth extended back as far as the insertions of the lateral recti muscles, ending behind in an abrupt well-defined margin, while below it shelved off gradually into normal conjunctiva. The eye was frozen and bisected in the vertical meridian. The interior of the eye appeared perfectly normal except for opacity of the lens, and the growth did not appear to have invaded the sclerotic or cornea.

Microscopical Examination.—Sections were stained with hæmatoxylin and eosin, with Van Gieson's stain, and with polychrome methylen blue. The tumour was found to consist chiefly of small round, oval, or polygonal cells, slightly larger than lymphocytes, with round or oval deeply-staining nuclei and very little protoplasm. Among these there was a very much smaller number of cells resembling endothelial cells, scattered irregularly, sometimes singly (in section), sometimes in groups. There were also a few polymorphonuclear leucocytes, and in sections stained with polychrome blue, some mast cells were seen, and also some resembling plasma cells. In a very few places traces of a fine intercellular reticulum could be seen, consisting apparently of processes of the endothelioid cells, but in some parts this was not visible. There was no definite connective tissue capsule, but septa of fibrous connective tissue divided the growth into large lobules. The growth was well supplied with blood-vessels, the larger vessels running in the septa, branches entering the lobules accompanied by a fine connective sheath and then breaking up into smaller branches, and capillaries whose walls consisted of a single layer of endothelium only.

The growth showed a distinct tendency to infiltrate surrounding parts. It extended rather more than a millimetre on to the cornea. Beneath it Bowman's membrane was destroyed, and the superficial lamellæ of the substantia propria were infiltrated with small round cells. There was a similar infiltration of the most superficial lamellæ of the sclera beneath the growth, and the sheaths of some of the perforating vessels were infiltrated for a short distance, but the deeper layers of the sclera were quite free from infiltration. The superior rectus muscle was densely infiltrated, the fibres appearing in section embedded in a mass of tumour cells. The tumour was entirely free from pigmentation.

Epibulbar sarcomata are generally melanotic, primary leucosarcoma in this position being very rare, although recurrent growths after removal of melanotic sarcomata are sometimes unpigmented.

It has been generally held that epibulbar sarcomata are relatively benign growths that may be safely treated by simple abscission. But by a careful analysis of a large number of published cases, Verhoeff and Loring* have proved that this view is erroneous, and that, in fact, these tumours possess a high degree of malignancy, for among the forty-four cases of which they were able to obtain a history subsequent to the operation of simple abscission, recurrence had occured in thirty-six, *i.e.*, 81.8 per cent. In many cases metastases had occurred.

It appears advisable, therefore, in every case to excise the eyeball with the tumour, together with a liberal margin of the surrounding tissues.

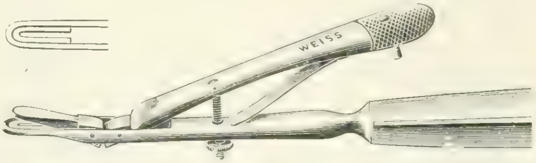
NOVELTIES.

DESCRIPTION OF SCLERECTOMY PUNCH.

BY

JOHN HERN, M.D.
DARLINGTON, ENGLAND.

THIS punch consists of a handle (straight) measuring 3 in. to hinge of lever, and ¾ in. from the hinge of lever to the end of the lower or female blade; the lever is so hinged to the handle that when it is depressed, the upper or male blade is depressed into the lower, punching out a piece of tissue, which is held and can easily be removed by any pointed instrument passed into a fine fenestrum in this lower blade.



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*Verhoeff and Loring.—*Arch. of Ophthalmology*, Vol. XXXII, 1903, p. 97.

The advantages of this instrument over most of its kind appear to be:—

(1). The size of the piece of tissue punched out can be regulated by the operator by using the screw adjustment, regulating the opening of the blades.

(2). The lower blade is in a straight line with the handle. The operator can therefore always know its exact position, as it is also immobile.

(3). The piece of tissue removed, is held firmly in the female or lower blade and cannot therefore be lost in the interior of the eye, as sometimes happens with the trephine.

(4). The simplicity of the instrument, thanks to Messrs. Weiss & Son, of Oxford Street, London, who have faithfully carried out my suggestions.

TRANSLATION.

PROGRESSIVE FAMILIAL MACULAR DEGENERATION (STARGARDT): FIVE PERSONAL OBSERVATIONS.*

BY

DR. A. DARIER,

PARIS, FRANCE.

STARGARDT[1] has related the history of two families; the first, of four individuals, all affected; and the second, in which three of five were affected. There was in these families no other familial disease of the eye; the parents were in good health, and not connected by ties of consanguinity. The malady commenced by a central scotoma for green and red towards the age of twelve or fifteen years, without appreciable lesions of the fundus oculi; then came a relative, and later an absolute, scotoma for white; and, lastly, there was total loss of central vision. The periphery of the visual field remained normal for white and for colours. It is probable that the first ophthalmoscopic signs did not make their appearance until after the first symptoms. They commenced by an irregularity in the pigmentation of the macula, with greyish-yellow spots. Whitish streaks and patches might appear around, as well as pigmentary masses, which assumed the form of osteoblasts. The yellow spots, increasing in size, ended by fusing together, so as to form a single horizontally oval spot, usually a third as large as the papilla, but sometimes even two or three times bigger.

This spot, had a greyish-yellow colour, and was outlined with pigment, which was also scattered over its surface. The lesions attained their maximum towards twenty years, and then remained for long without change.

J. E. Jennings[2] has reported three cases observed in the same family: two sisters aged 19 and 21 years respectively, and a boy aged 17 years. One saw in the macula an oval spot larger than the optic disc and of a greyish colour bordered by a narrow pale-yellow zone, free from pigment. The parents of these children were cousins German The sight, which had been poor since infancy, was steadily getting worse.

In 1897, R. D. Batten[3] (quoted by Stargardt) related a couple of instances of an analogous affection in two brothers, respectively aged 14 and 20 years, who showed pallor of the papillæ and dark pyriform spots in the macula. Six years later, after a temporary aggravation, sight remained at a standstill, with a central scotoma, and normal peripheral field. Two of seven children were affected. The youngest child developed in a normal way until he reached the age of six years. Then he suddenly became hyperexcitable, shouting and screaming for hours at a time, so much so indeed, that he was placed in a mental asylum. Central vision was abolished from his seventh year. It was the same as regards the other child.

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* *La Clinique Ophtalmologique*, janvier, 1914.

Lutz[4] related the history of a family with hereditary choroido-retinitis.

The family consisted of nine children—six girls and three boys. Four of the girls were affected towards 11 or 12 years of age, without known cause, with a rapid, painless diminution of sight, unaccompanied by metamorphopsia, and the symptoms persisted until an advanced age (78 years) without modification up to the date of Lutz's publication The fundus changes were limited to the posterior pole. Amongst the youngest subjects they were limited to the macula, but in the elder subjects they exceeded those limits but without affecting the peripapillary zone. Foveal or macular reflexes could be recognized in neither group of cases.

The changes took the form of little greyish-yellow spots between which were seen points of dark pigment. At certain spots, among the elder sisters, these little spots had fused to form larger spots of a pale-grey colour and almost transparent aspect. The retinal vessels traversed the *plaques* without modification. Large pigmentary accumulations were nowhere to be seen. The optic disc was normal, and nothing abnormal was to be recognized at the periphery of the fundus.

The ophthalmoscopic picture was quite of a special nature, and might be likened to that of senile macular choroido-retinitis.

The light sense was enfeebled, although vision was less good in full day-light, which could be explained by the central scotoma present in every instance. No history of syphilis, tuberculosis, or injury.

A. W. Stirling[5] relates three cases belonging to a non-consanguinious family.

The first, towards the age of eight years, became almost blind in the course of about a week. She is now twenty-three years of age, able to decipher large characters only, which is much the state of things since the eyes first failed.

A brother, who died at nineteen years, lost his sight suddenly, towards the age of eight years. Another brother, aged eighteen years, enjoys a good sight. The last, aged thirteen years, also almost lost his sight in a week when he was eight years of age. Two sisters, of fifteen and nine years respectively, have good sight.

To complete the history it should be added that there had been five other children in the family, two dying when about six weeks of age, and three being born dead.

Nettleship[6] and Doyne[7] have each narrated cases of the same kind.

In a recent communication, Stargardt[8] relates three additional observations in the same family. They are briefly as under:

I.—A.S., 45 years, found that at the age of ten years, he could no longer distinguish fine characters. Sight failed progressively, although when he was twenty years of age, he could still read with a glass. To-day he is able to make out only No. 4 on Snellen's type with a + 15 D. spherical lens. Absolute central scotoma; optic disc dull, and macular choroidal atrophy spread around the disc.

II.—E.S., 43 years, sight failed at fourteen years. There was a marked aggravation at thirty years, and then matters remained stationary. Absolute central scotoma in the macula, twice as large as the optic disc.

III.—K.S., 38 years, sight failed at fourteen years. R.V. = fingers at 25 cm. L.V. = 1/60. Absolute central scotoma. A large gap around the papilla, extending 5 to 6 disc diameters temporalwards and 2 to 3 diameters nasalwards.

With the foregoing three new cases, of which the macular lesions had not preserved their original type, Stargardt has collected sixteen cases (ten personal, two by Batten, and four by Lutz). If to them we add Stirling's three cases and the five that I am about to describe, we reach a total of twenty-three, from which we may (in perfect accord with Stargardt) construct the following **symptom-complex** :—

The beginning of the affection, in general insidious and progressive, is on the average about the twelfth year. But in certain families it makes its appearance in all the members affected suddenly or in the course of about a week, as in the cases of Lutz and of Stirling. As regards my own five patients, the *début* was insidious and slow, as was the evolution of the disease, which we are still following, after having already watched it for more than twenty years.

To begin with, one sometimes finds no appreciable lesion of the fundus, as at other times we may discover macular changes even before the patients complain of their sight. The latter may be the case among the members of a family who accompany the actual patient.

The two eyes are generally seized simultaneously, and sight is usually almost the same on the two sides, and progression follows the same course.

The central vision is always affected. Fine and delicate characters, Greek and Hebrew letters, logarithms, the varied accents of music, etc., are the first to bother the eyes.

But the complete evolution of the affection is very different according to the case. In Stirling's three patients the disease evolved in about a week, and remained almost stationary for twenty-five years in the oldest, and thirteen years in the youngest patient. In the four cases described by Lutz diminution was very rapid in the eleventh or twelfth year. In the other cases evolution was essentially slow and insidious for from ten to thirty years, and then, all of a sudden, there was an aggravation which abrogated reading, possible up to then. After thirty years, the condition became almost stationary.

Up to now Stargardt has held that the lesions were limited to the macular region ; but in the last three cases of the family S., reported by him (*loco citato*) the lesions were present also around the periphery of the papilla and in the periphery of the retina. But those are exceptional cases. However, Stargardt has been led to make some *rapprochements* between macular degeneration, on the one hand, and an inverse type of retinitis pigmentosa, on the other, the one being localised in the macula, while the other spares only that region ; in one the rods are affected, and in the other the cones. This view, however, is open to criticism. We know nothing whatever at present as to the pathological anatomy of progressive macular degeneration. In it Lutz sees a choroiditis, while Stargardt denies the existence of all inflammation, and recognises only a process of degeneration, resembling that described by Stock in idiotic family amaurosis and by Oatman, who has found in a certain number of idiots macular changes much resembling those described in these pages.

Batten's two cases appear to belong to this maculo-cerebral type, of which instances have been placed on record by Oatmann, Hirschberg, Mayou, Nettleship, and Stephenson (*familiare amaurotische Demenz*). It is characteristic of this maculo-cerebral type that it begins between six and seven years with macular and cerebral symptoms. We should therefore consider familial macular degeneration as it occurs (a) with or (b) without dementia.

It is probable that the more precocious the macular changes, the more likely are the cerebral functions to be affected ; when the eye symptoms do not appear until twelve or fourteen years, the brain is not affected. How and why are these lesions produced ? We know nothing about them.

In the five cases I have been able to follow closely for many years I have always made the mental reservation that hereditary syphilis might underlie the condition, but I have never been able to find any positive sign of it, either in the patients themselves, or in their parents, or grand-parents. The temporarily favourable effect of intra-venous and sub-conjunctival injections of mercury cyanide pleads in favour of syphilis, although not strongly.

Stargardt places syphilis altogether on one side, and I agree with him.

We have to do, then, with an hereditary blemish of which we do not know the cause, much in the same way as we are still ignorant of the cause of Leber's hereditary optic neuritis, which also develops by preference in adolescence, usually towards the sixth year, by the abrupt or progressive appearance of a central scotoma which nearly always affects both eyes, with or without appreciable lesions of the fundus oculi. Marked pallor of the temporal half of the disc follows later. As in familial macular degeneration, blindness seldom becomes complete. Up to now the familial affection has not been found in several generations. It is true that we are only at the beginning of its study, while Leber's disease has been found:

Fifteen times in two generations;
Three times in three generations;
Four times in four generations.

As there are many forms of familial neuropathic disease, in much the same way we should have various forms of familial affections of the eye. One may note in general that these affections are so much the graver the younger the age at which they begin, and this is just as true of Tay-Sachs' disease as it is of retinitis pigmentosa and macular degeneration. According to Frenkel, the peripheral and central neurones are the first to be affected; even in Leber's atrophy, the retinal neurones show the primary lesion.

Personal Cases.

In the **A family** there have been five children, four of whom survive, one daughter having died at the age of 22 years from typhoid fever.

Two girls have been under my care for macular lesions characteristic of familial and progressive degeneration. A third is said to have feeble sight, but as she has not been brought to consult me, it is probable that she is not seriously affected.

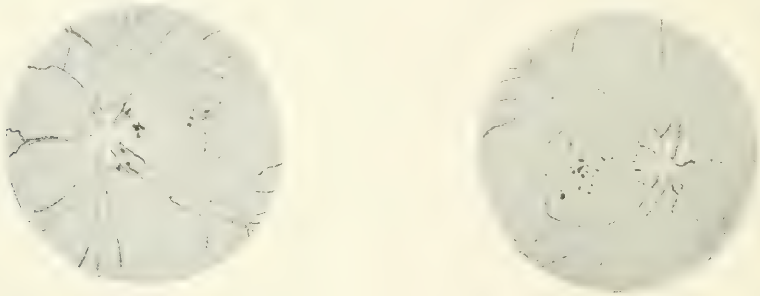


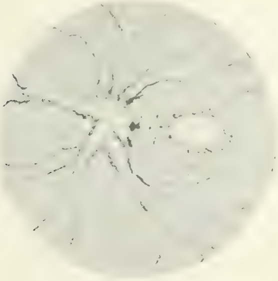
Fig. 1. Case I. (Sept., 1893). Fig. 2.

I am unable to discover any antecedents pointing to heredito-syphilis. The father, who had led a pleasant enough life, died at 35 years. The mother had reached an advanced age, about 76 years. She was operated upon with success for glaucoma and then for secondary cataract, and until death had been able to read the smallest print.

I.—Mme. J. A. came to consult me in 1893, complaining of poor sight since childhood. She could not do the fine work of stitching and embroidery. She was treated, without result, by tonics, ferruginous mixtures, etc. She was unable to read for long together: the letters were said to dance before her eyes. She had employed for reading a glass of + 4 D. spherical since she was twelve years of age. On September 27th, 1893, R.V. + 1.5 D.=1/10, and she read No. 5 with + 4 D. spherical. L.V. + 1.5 D. sph.=1/10, and read No. 5 with + 4 D. spherical. But she could not read the letter which she fixed with her eye and had always to fix a little to one side before she succeeded in doing so. Here are the sketches of the macular lesions taken in September, 1893 (Figs. 1 and 2).

A few hypodermic injections of mercury cyanide were made, and in 1903, R.V. + 1.5 D. sph. = 1/10 L.V. + 1.5 D. sph. = 1/12. With + 6 D. sph. read No. 5. The lesions were notably more widely spread, but the vision had not suffered so much in twenty years as one feared it might have done (Figs. 3 and 4).

II.—Mme. R. A. Her sight had been poor for longer than she was able to recollect, and this had rendered the pursuit of her studies very difficult. "I have never," said she, "been able to poke my nose into a dictionary, and in class I could never read that which was written on the black-board unless I was very near. My eyes easily became tired, and every two or three lines I was obliged to raise them in order to rid them of fog. I was a big girl at twelve years, and my sight then underwent a transformation in the sense that I was able to read longer without becoming tired. When I was eighteen, I was forced to obtain a *lorgnon* to read with. Then when I read of an evening, it seemed to me that the lamp no longer gave any light; it was my sight that had fallen. For a long time I have not been able to read. I get others to read to me, or I make out the print with difficulty and a magnifying glass."



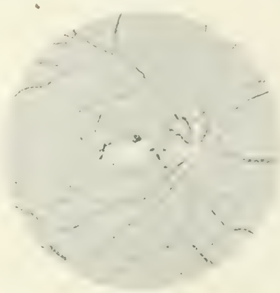


Fig. 3. Case I. (Oct., 1913). Fig. 4.

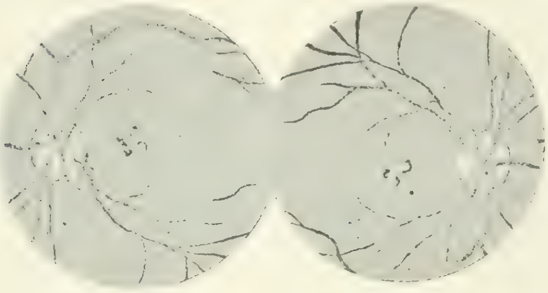
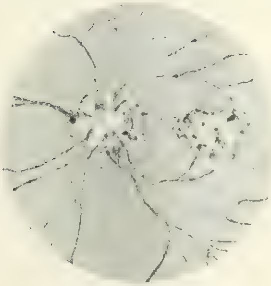


Fig. 5. Case II. (Nov., 1898). Fig. 6.



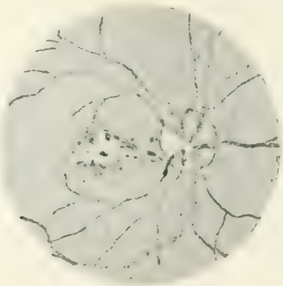


Fig. 7. Case II. (Sept., 1913). Fig. 8.

On November 4th, 1898, R.V. = less than 1/10, L.V. = 1/10.

With the ophthalmoscope, one found small macular lesions, not greater in extent than two or three millet seeds, and very little pigmented, and of a rose-grey colour (Figs. 5 and 6).

Treatment by intramuscular and intravenous injections, followed by a few subconjunctival injections of mercury cyanide, appeared to improve sight for a time, but as soon as the treatment was discontinued, sight began again to fail.

The state of the macular lesions towards the end of 1913, is shown in the accompanying sketches (Figs. 7 and 8). R.V. = 1/50, L.V. = 1/40.

The **O family** was composed of seven children, of whom one alone was a girl. Three boys were affected with macular degeneration: the first, the second, and the fifth. The father died a few months ago, at the age of 90 years. No trace of heredito-syphilis.

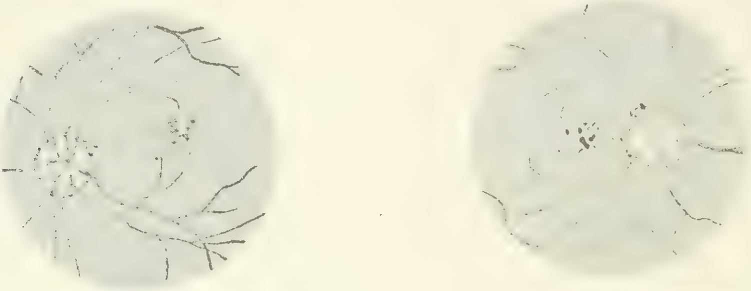


Fig. 9. Case III. (Feb., 1892). Fig. 10.

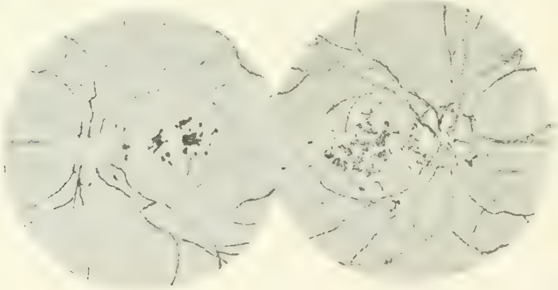


Fig. 11. Case III. (Sept., 1913). Fig. 12.

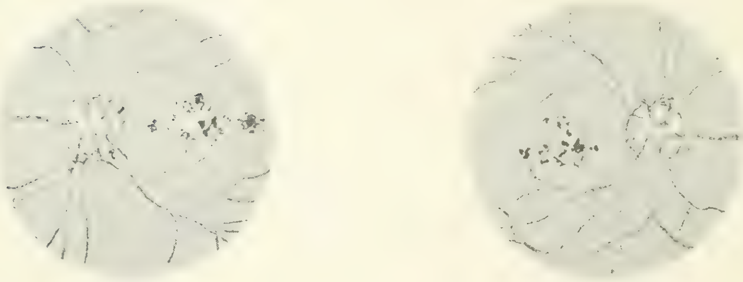


Fig. 13. Case IV. (Feb., 1892). Fig. 14.

III.—Charles O., now aged 38 years, sight has been poor ever since he remembers. Towards five years of age his father taught him Hebrew, when he could see the details of letters, but since he reached 7½ years of age, he has not been able to decipher those characters, and, shortly afterwards, he became unable to read his class-books, the print of which was too small for his eyes. Fortunately, he was the possessor of a very good memory, so that he knew his lessons after they had been read over to him twice. He remembered having seen his brother draw maps, a thing he had never been able to accomplish himself. He managed to get through his studies until he had reached the age of fifteen years, when I saw him for the first time.

The state of his eyes in February, 1892, was as follows (Figs. 9 and 10). V.=1/10, not improved by glasses. A series of subconjunctival injections of sublimate was given, but they had no result, neither did numerous hypodermic injections of mercury.

September 18th, 1913 (21½ years after the first examination).—Since 1892 no treatment has been followed, and the sight has continued to fail. Now he reads with great difficulty, at a distance of seven centimetres, No. 7 of Wecker's chart, and that only with the good (right) eye. Colours are recognised when held close : blue, well ; a lively red is seen as a brick colour, while green sometimes appears to the patient as buff or drab. (Fundi as shown by Figs. 11 and 12).

IV.—Leon O., aged 45 years, like his brother, had always had very feeble sight. To begin with, he had much difficulty in reading fine characters, and in order to see the black-board, had to be placed in the front row (Figs. 13 and 14).

Nevertheless, he read and was able to follow his studies until he was eighteen years of age. Glasses did not help him. He was able to read only with a magnifying glass.

In 1892, when he was 25 years of age, I saw him, and made the sketches given below of the macular lesions on the 4th of February in that year (Figs. 13 and 14).

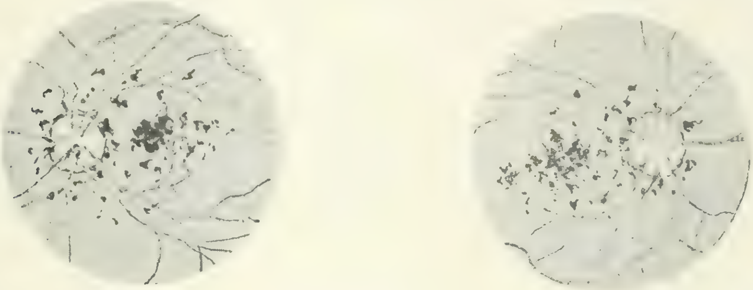


Fig. 15. Case IV. (Sept., 1913). Fig. 16.

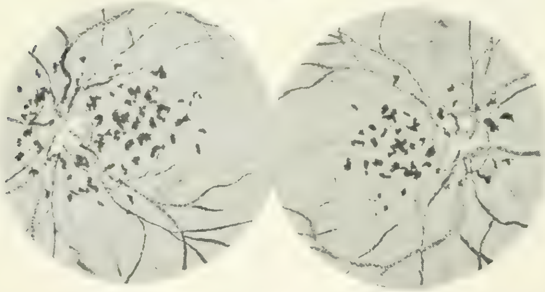


Fig. 17 Case V. (Oct., 1913). Fig 18

September 15th, 1913.—R.V.=1/30 excentrically. L.V.=1/20 excentrically. No. 9 Wecker, and with magnifying glass, No. 2 (Figs. 15 and 16)

V.—Maurice O., aged 47 years, whom I have seen once only, and the state of whose eyes is represented in the accompanying figures (Nos. 17 and 18). Like his two brothers, he never remembers to have been able to read fine print and Gothic letters. His lessons had to be read to him, and it was only with a strong glass that he was able to read a few lines for himself. All of this, however, did not prevent him from becoming a journalist. It was impossible to find any glasses capable of improving his sight, as had been the case also in his brothers. R.V.—I. D. = 1/15. L.V.—I. D. = 1/20.

SYDNEY STEPHENSON.

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CURRENT LITERATURE.

NOTE.—Communications of which the titles only are given either contain nothing new or else do not lend themselves to abstract.

I.—ANATOMY, PHYSIOLOGY, AND DEVELOPMENT.

(1) **Magitot, A. and Mawas, J.—A study of the development of the vitreous body and of the zonule in man. (Etude sur le développement du corps vitré et de la zonule chez l'homme.)** *Ann. d'Oculistique*, septembre, 1912.

(2) **Leplat, Georges.—A contribution to the study of accommodation in birds. (Contribution à l'étude de l'accommodation chez les oiseaux.)** *Ann. d'Oculistique*, décembre, 1912.

(3) **Mawas, J.—Notes on the anatomy and physiology of the accommodative apparatus of the eye. (Notes sur l'anatomie et la physiologie de l'appareil accommodateur de l'œil.)** *Ann. d'Oculistique*, septembre, 1913.

(1) This article is a *résumé* of a communication by **Magitot** and **Mawas,** of Paris, to the *Archives d'Anatomie Microscopique*.

The authors consider that from the commencement of its development both the solid and the liquid parts of the vitreous are of neuroglial nature, and therefore of ectodermic origin. They distinguish the following three stages in its development.—(1) The primordial vitreous. This consists of a fibrillation of the marginal layer of the embryonic retina which is formed by protoplasmic prolongations of the supporting cells, which are the first to become differentiated in the inner layer of the ocular vesicle. From the third to the seventh week the lenticular vesicle takes a slight part in the formation of this primordial vitreous, the cells from its deep surface sending out filamentary prolongations which make bridges to the retina. On the other side migratory cells containing large drops of secretion appear during the fourth and fifth week in the marginal layer of the retina, and pass into the vitreous, where they act as veritable holocrines. During the fourth week the hyaloid vascular system makes its appearance in the secondary optic vesicle, and rapidly develops so as to fill almost the whole of the ocular cavity. It consists of mesodermic elements continuous with the similar tissue in front of the lens, and does not in any way enter into the constitution of the vitreous, its *rôle* being purely vaso-formative. It is mesenchyma which mixes with and conceals the ectodermic vitreous. (2) The transitory vitreous.—Towards the end of the eighth week a sheath of neuroglial cells appears in the optic nerve around the artery. In the ninth week this clothes the whole of the arterial trunk. Towards the third month it spreads to the lenticular and vitreous branches. It is composed of two kinds of cells, one of the elements of which bristle with hairy prolongations, remain attached to the vessels, and form vitreous fibres. Hitherto these have been confounded with the vessel walls and regarded as connective tissue elements giving rise to the belief in a mesodermic vitreous. The cells of the other class become mobile, and some of them, losing their prolongations, become round and vesicular and break up after having reached the vitreous. These are charged with the *rôle* of secreting the vitreous fluid. The neuroglial hyaloid sheath has an existence as ephemeral as the vessels it clothes and reaches its apogee towards the end of the third month, from which time its elements are compressed by the vitreous secreted by the retina and pushed back into the centre, where they occupy a funnel-shaped space with its base anterior. During the fourth, fifth, and sixth months this temporary vitreous constitutes the central vitreous which diminishes more and more as the central vessels disappear. Traces of it often remain in front of the papilla. The few isolated vitreous cells which are found at birth are probably also relics of these special formations. (3) Permanent vitreous. —This is formed by the development of the primordial vitreous, which remains minimal until the third month. About the tenth week, however, there is a sharp reawakening of its activity. As the eye grows Müller's fibres proliferate and send out a dense fine fibrillation. This arises from the whole extent of the optical retina until the differentiation of the ciliary body and appearance of the rudiment of the ora serrata, from which time (fourth month) the formation of the vitreous is a function of the ciliary retina, the exoplastic prolongations of which spread in all directions. The most anterior fibres become attached to the lenticular capsule, forming the zonule, which is only dense vitreous consisting of associations of fibrils differentiated for a definite physiological function. The cells of the ciliary retina, therefore, are adapted neuroglial cells and the homologues of the cells of Müller. A little temporary vitreous remains in the centre of the eyeball up to the end of the seventh month, when it comes into contact with the condensed fibres bounding the permanent vitreous. There is therefore no central hyaloid canal, but only a line of junction comparable to the stars formed by the junction of the crystalline cells with each other. There is also no true hyaloid membrane. The psuedo-membrane which exists is only an appearance due to the mosaic formed by the bases of the neuroglial cells of the optical or ciliary retina.

The authors therefore conclude that the eyeball is filled with a fibrillary tissue forming an integral part of the retina. The vitreous is retinal neuroglia, and its detachment is a tearing of the filamentary prolongations of the supporting cells. Apart from the sclera, choroid, and lens, the eye thus appears more than ever a diverticulum of the central nervous system, penetrated, like it, at a period of development by transitive mesodermic vascular elements. Briefly, what we call the vitreous and zonule are only neuroglia adapted to optical functions. R. J. COULTER.

(2) **Leplat**, of Liège, gives a description of the apparatus of accommodation in birds, founded on the study of a large number of histological and embryological sections, from which he draws the following conclusions:—(1) The pupillary sphincter in birds is very highly developed because it plays an important part in accommodation. (2) The dilatation of the pupil is caused in birds, as in mammals, by the fibrillar membrane of Bruch. The radial striated muscular fibres hitherto considered as dilators are accommodative. (3) This action of the iridic muscles is concomitant with that of the ciliary muscles. The author considers that the results of his histologic study confirm and corroborate the conclusions of Hess with regard to the accommodation of birds. R. J. COULTER.

(3) **Mawas**, of Paris, has examined a number of normal human eyes removed in the course of operations on the orbit and has studied in them the anatomy of the accommodative apparatus. The eyes were fixed immediately after removal in various solutions, the action of which on the ocular tissues is well-known to the author who is satisfied that there was good fixation of the muscle. The results obtained may be summarised as follows.—The usual description of the ciliary muscle is too schematic. Its form varies much, not only with age and in different individuals, but even in different sections of the same specimen. In humans there is no true ciliary sphincter, but an annular

muscle thickened in front, the great majority of the constituent fasciculi of which run in an antero-posterior direction, although a few of them are oblique. There is no true tendon or special attachment of the ciliary muscle, which is a smooth muscle and does not act in one direction only, but by a shortening of its fibres, the effect of which is partly to shorten the smooth part of the ciliary body and draw the corneo-iridic angle backwards and partly to telescope the ciliary processes. In mammals, the general direction of the fasciculi of the ciliary muscle is meridional and they are concentric with and parallel to the sclerotic. The effect of their contraction is to shorten the surface of the ciliary body and bring the ligamentum pectinatum and the ora serrata closer together, necessarily causing relaxation of the posterior and tension of the anterior fibres of the zonule. In previous communications the author has shown that the zonule of Zinn is formed of a collection of elastic and extensible fibres which join the lens to the ciliary body, spring from the whole length of the ciliary retina from the ora serrata to the irido-ciliary angle, and are to be regarded as exoplastic developments of the clear cells of the ciliary retina. The ciliary muscle is completely isolated from the suspensory apparatus of the lens by connective and elastic tissue which surrounds and permeates it, and through which it acts on the zonule. It is well-known that the ciliary body is asymmetrical, and assuming that the ciliary muscle, as is probable, contracts equally throughout, this will cause, (1) inequality of accommodation in the different meridians of the lens, (2) correction or compensation of corneal astigmatism, (3) displacement of the lens from the side where the ciliary body is most developed, (4) tremulousness and rotation of the lens It also explains astigmatic accommodation without assuming the isolated action of a group of ciliary processes. The contraction of the ciliary muscle thus causes shortening of the whole ciliary region, which, in turn, causes relaxation of the posterior fibres of the zonule with traction backwards and outwards of the anterior fibres. The author has studied the effect of these changes on the curvature of the lens in a large number of cases of chronic glaucoma, hydrophthalmos, intra-ocular tumours, irido-cyclitis, etc., in which a distension of the globe is produced which modifies the ciliary circle and tends to separate it from the lens, thus stretching the zonular fibres which modify the form of the lens, and has found that:—(1) when there is a generalised traction of the zonule the periphery of the lens is flattened and its centre more curved; (2) it seems that there is a direct relationship between the flattening of the edges of the lens and the traction of the zonular fibres; (3) there does not seem to be an accurate correlation between the flattening of the edges of the lens and the increase in the curvature of its centre; (4) the nucleus of the lens resists zonular traction up to a certain point only, and may undergo modification during accommodation; and (5) the variations in the posterior surface of the lens are parallel and in certain cases are equal to those of the anterior surface.

The author concludes by stating that he does not pretend to have solved the complicated problem of accommodation, but that he considers histological researches to be indispensable, in order to prepare the way for physiological experiments. R. J. COULTER.

II.—GLAUCOMA IN YOUNG SUBJECTS.

Löhlein, W.—On the Glaucoma of the Young. (Ueber das Glaukom der Jugendlichen.) *Bericht der Ophthalmologischen Gesellschaft*, Heidelberg, 1913, p. 97.

Löhlein, of Greifswald, read a valuable paper before the Heidelberg Congress dealing with glaucoma in the young. He pointed out that glaucoma, apart from buphthalmos, was sufficiently common in persons under thirty-five years of age to be worthy of careful study, more especially since it varied in certain important particulars from the disease as seen in older individuals.

There is practically no histological material at disposal, so that youthful glaucoma can be investigated only from the clinical standpoint. The author has formed his views partly from the examination of ten cases of his own, and partly from the study of eighty-two published cases.

Juvenile glaucoma has as many varieties as ordinary senile glaucoma. It has no special characteristics which place it in a class separate from the disease in older subjects, differing in this respect from buphthalmos, which, as we know, is caused by a definite defect in development, such as absence of Schlemm's canal. Much as in senile glaucoma, acute cases of the disease are much rarer than chronic. Again, glaucoma simplex is commoner in myopes and emmetropes in both ages, whereas inflammatory forms appear mainly in hypermetropes. The two conditions differ, however, in three important particulars.—First, in the senile form women are chiefly affected; in the juvenile type the sufferers are mainly of the male sex, a fact which is equally true of buphthalmos. Secondly, about 15 per cent. of senile glaucomas are myopic, but 50 per cent. of the juvenile cases are short-sighted. Lastly, in the aged the proportion of inflammatory glaucomas to glaucoma simplex is 3—2; in the juvenile form 62 per cent. of all cases are instances of glaucoma simplex

Forty per cent. of the juvenile cases commence between the ages of 15 and 20 years. They often remain for a long period in the prodromal stage. This peculiarity may be explained by the fact that the juvenile eye is more labile and distensible than the senile globe, and can, in consequence, tolerate high tension for a longer period than the older organ.

Three other types can be differentiated:—(1) glaucoma with a deep anterior chamber; (2) myopic glaucoma; and (3) hereditary glaucoma.

(1) A deepened anterior chamber is found only in the juvenile disease. It is present in one-fifth of all cases of youthful glaucoma. Another fifth have a normally deep chamber. These cases are almost all instances of glaucoma simplex. Even in the hæmostatic or inflammatory form in one quarter of the examples the anterior chamber is not deeper than the normal. Most of the deepened chambers are seen in myopic eyes, a few in emmetropic eyes, but more in hyperopic eyes. The deep chamber suggests an analogy with buphthalmos; it may perhaps be a late form of this disease, and caused by developmental abnormalities, but in the absence of histological evidence, we can only guess that this may be the case.

(2) The abnormal association with myopia is a striking factor in juvenile glaucoma. The author does not agree with the commonly accepted idea that myopia confers a sort of immunity to the disease. Glaucoma is associated with myopia in about 15 per cent. of senile cases, which is about the average

frequency of myopia in the whole population. There can be no question of immunity: the myopic are as liable to glaucoma as are the emmetropic and the hypermetropic.

(It is necessary to remember that Löhlein is speaking of Teutonic races. With us glaucoma is rare in the myopic, and myopia is also proportionally uncommon in England.)

But when we come to juveniles the state of things is quite different: 50 per cent. of the cases are myopic, so that we are tempted to assume that the young myope is predisposed to glaucoma. But there are two other possibilities: first, there may be a type of glaucoma in the young which engenders myopia, or, secondly, both conditions may have a common cause. One thing is quite certain, namely, it cannot be a mere chance that the two conditions are so frequently associated.

v. Graefe suggested that glaucoma was a sequel to myopic choroiditis, but we now know that the choroidal changes are not inflammatory in nature, and so this explanation falls to the ground. The author has also noted that the high myopia found in these cases is strikingly free from changes in the fundus, an observation confirmed by Seefelder with reference to the high myopia found in buphthalmos. The clinical picture therefore affords no support to the view that the glaucoma is a direct sequence of high myopia. Ischreyt examined two cases of primary glaucoma in short-sighted eyes and found nothing which suggested that the high tension was caused by the anatomical changes characteristic of high myopia.

The second theory remains: perhaps some of the cases of myopia grow upon the soil of juvenile glaucoma. The author has seen two cases of youthful glaucoma in which axial myopia of high degree developed, and Puech has published a similar case. The appearance of myopia in these cases should not surprise us, for we regard it as the rule in buphthalmos, and we believe that slight hypertension is a factor in the production of simple myopia. It is therefore reasonable to suppose that in some cases the high tension in infantile glaucoma is the direct cause of the myopia which so frequently accompanies it, and that in others the two conditions have a common cause.

(3) We have now to consider the influence of heredity.—Schmidt-Rimpler, in his monograph upon glaucoma, states that glaucoma is not a hereditary disease, and adds that the same remark applies to the juvenile type. Löhlein says that as regards senile glaucoma, Schmidt-Rimpler is correct in his view, but that he is in error in thinking that hereditary influences have no share in the development of the youthful variety of the disease. Löhlein finds evidence of inheritance in 20 per cent. of the cases, and thinks that, in reality, the figure is much higher. As Priestley Smith first pointed out, the anomalies which produce the disease are probably inherited, as they certainly are in buphthalmos. More than 50 per cent. of the cases have associated symptoms which we recognise to be hereditary in type. For example, cases were complicated with hyaloid arteries; with persistent pupillary membranes; with anomalies of the retinal vessels; with partial lamellar cataract; with colobomata; and with deformities of the globe, such as microphthalmos and very high myopia. Certainly, the anomalies do not in themselves predispose to glaucoma, but they suggest the associated presence of those malformations which hinder the free circulation of the intraocular fluids. Löhlein cites a family of four sisters, three of whom suffered from glaucoma simplex, while the fourth had true buphthalmos.

The conclusion Löhlein comes to is that some of the cases must be associated with buphthalmos, in so far as both are caused by inherited anomalies, while the others, and especially all cases which commence in the fourth decade of life, are examples of precocious senile glaucoma.

Discussion.

Gilbert, of Munich, said that Löhlein's statement that myopia and youthful glaucoma were frequently associated, corroborated his own statistics, which showed a relationship between short-sight and senile glaucoma simplex. He had found the refraction to be myopic in 30 per cent. of these cases He had further watched the development of a myopia, which reached five dioptres, in an emmetropic girl who suffered from juvenile glaucoma. He also cited a case in which two parents suffered from inflammatory glaucoma, and several of their descendants developed juvenile glaucoma, which led to blindness.

Fuchs, of Vienna, divided juvenile glaucoma into four classes :—

(1) True glaucoma with a shallow anterior chamber in members of a family in which cases of the disease are common and appear early in life. This type is identical with senile glaucoma. It is hereditary and familial.

(2) Glaucoma caused by congenital malformations, such as aniridia; buphthalmos belongs to this category, a disease which is congenital and familial.

(3) Glaucoma with a deep chamber and myopia.

(4) Glaucoma with deep chamber and very fine keratitis punctata. This is a secondary glaucoma, but the precipitates upon Descemet's membrane may at times be absent and in consequence the disease may be mistaken for a primary glaucoma.

Hirschberg, of Berlin, agreed in the main with the conclusions of the reader of the paper. He had followed up for a long time a case in which buphthalmos and juvenile glaucoma were associated in the same patient, a girl 16 years old. Hereditary influences could be detected even in simple glaucoma of adults.

Sattler, senr., of Leipzig.—The fact that Löhlein had gathered most of his cases from literature accounted for the absence of tonometric measurements. He noted that many myopic eyes appeared to be markedly hard. He cited a case in which absolute glaucoma eventually necessitated removal of the eye. The globe showed all the histological changes typical of advanced glaucoma, but none of those described by Seefelder and others in cases of buphthalmos.

Levinsöhn, of Berlin, said that the stretching of the globe caused by the raised tension of youthful glaucoma must on anatomical grounds cause a myopic refraction.

Wicherkiewicz, of Cracow, said that the tension of a myopic eye often felt normal to palpation, but the tonometer might show that it was raised. His experience had taught him that glaucoma might occur in myopic eyes. It was not influenced by de Wecker's sclerotomy nor by iridectomy, but could be held in check with pilocarpine and cocaine.

Vossius, of Giessen, said that heredity had much more influence in senile glaucoma than Löhlein believed. He alluded to the discrepancies between estimation of tension with the fingers and by the tonometer.

Seefelder, of Leipzig-Gohlis, after alluding to his work upon the histology of buphthalmos, said that he had had a case of juvenile glaucoma with extreme myopia, and had examined the eye microscopically. The axial length of the globe was 31 mm. In spite of the deep anterior chamber, a total peripheral anterior synechia was present in this case; the irido-corneal angle was obliterated, as it so often was in ordinary adult glaucoma.

Fleischer, of Tübingen, discussed the association of myopia with buphthalmos.

Lauber, of Vienna, described a case of juvenile glaucoma with keratitis punctata.

Wessely, of Würzburg, was not surprised at the discrepancies which existed between the tonometric reading and the clinical estimate. A tonometer did not measure intraocular tension alone ; other factors influenced its verdict.

Hamburger, of Berlin, confirmed Seefelder's statement, that Schlemm's canal was absent in 50 per cent. of the cases of buphthalmos.

T. HARRISON BUTLER.

III.—THE LUETIN REACTION IN EYE WORK.

Browning, S. H.—The Luetin test for syphilis and some results. *Ophthalmic Review*, January, 1914.

Little has been published respecting the Luetin Test in ophthalmology since M. Cohen printed his observations on the subject in the pages of the *Archives of Ophthalmology* in January, 1911 (see THE OPHTHALMOSCOPE, 1913, p. 541).

Browning, of London, now takes up the question. He has employed the Luetin test in conjunction with the Wassermann reaction in a series of eye cases, and has found that in several instances the latter was negative while the former was positive, and in most of these cases there was from the clinical point of view little doubt that the patients were syphilitic. In a few cases Browning has obtained a positive Wassermann and a negative Luetin test.

As a means of deciding whether a patient is cured of syphilis, the author is inclined to believe that the Luetin is superior to the Wassermann reaction. The skin test should possess great value where the question of syphilis is complicated by a history of some other protozoal disease, such as malaria. In chronic cases of syphilis, where the Wasserman reaction is positive in 60 to 70 per cent. of the cases, the Luetin reaction has special importance. Briefly, in 78 of the 100 cases he has examined both the Wassermann and the Luetin tests were made, and of that number the two yielded the same result in 62, or 79·2 per cent. The Luetin test was positive and the Wassermann reaction negative in 9 cases (interstitial keratitis, 4 ; choroiditis, 2 ; tabes dorsalis, 2 ; and severe anæmia, 1). Of the 22 cases where the Wassermann reaction was not done, 15 were indefinite cases of syphilis which had been treated ; these were all positive. Five were definite cases of syphilis with negative Luetin test.

SYDNEY STEPHENSON.

IV.—THE OCULAR COMPLICATIONS OF TYPHOID FEVER.

(1) **Kumagar, N.—A case of paralysis of the superior oblique in the course of typhoid fever. (Ueber einen Fall von Trochlearis-Lähmung im Verlaufe des Typhus abdominalis.)** *Centralbl. f. prak. Augenheilkunde*, September, 1912.

(2) **Fromaget, Henri.**—Typhoid osteitis of the frontal bone. (Ostéite typhique du frontal.) *Ann. d'Oculistique*, décembre, 1913.

(1) The patient of whom **Kumagar**, of Tokyo, writes, was a man, aged 28 years, who at the end of the third week of an otherwise mild but definite attack of typhoid fever, developed double vision. The eyes were examined four weeks after the onset of the diplopia and were found to be normal in every respect except for a paralysis of the right superior oblique. The condition cleared up in about seven weeks.

Discussing the ætiology of this case, Kumagar comes to the conclusion that the lesion was a peripheral neuritis of the fourth nerve and not a waxy degeneration of the muscle or a cerebral condition. A. H. LEVY.

(2) **Henri Fromaget**, of Bordeaux, records a case of osteitis of the frontal bone in a woman, aged 48, which commenced two years after an attack of typhoid fever, and after running a chronic course for two years, suppurated. The abscess was opened and curetted, with the result that the tumour rapidly disappeared, and in twelve days the patient was discharged free from all inflammation. Bacteriological examination showed the presence of Eberth's bacillus in pure cultures.

Typhoid osteo-periostitis of the cranial bones is rare, and the author has been unable to find any other recorded case of the condition in the frontal bone. He remarks on the occurrence of suppuration in association with pure cultures of Eberth's bacillus, which is usually non-pyogenic, and adopts the explanation of Chantemesse, who considers that this micro-organism is pyogenic in subjects who have acquired immunity to its ordinary action.

R. J. COULTER.

V.—COMPLICATIONS FOLLOWING ELLIOT'S OPERATION.

(1) **Schur.**—Detachment of the choroid after Elliot's trephining. (Aderhautablösung nach Elliotscher Trepanation.) *Klin. Monatsbl. f. Augenheilkunde*, September, 1913.

(2) **Schur.**—Late infection after Elliot's trephining operation. (Spätinfektion nach Elliottrepanation.) *Klin. Monatsbl. f. Augenheilkunde*, September, 1913.

(3) **Harms, H.**—A case of late infection after Elliot's trephining. (Ein Fall von Spätinfektion nach Elliotscher Trepanation.) *Klin. Monatsbl. f. Augenheilkunde*, September, 1913.

(1) **Schur**, of Tübingen, reports three cases of detachment of the choroid observed in a series of 85 trephining operations. This represents 3·5 per cent. of the cases, and comparing it with Fuchs's estimate of 10 per cent. for the occurrence of the same complication after glaucoma iridectomies, and Meller's estimate of 22 per cent. for Lagrange's operation, the author holds that his experience supports Fuchs's view, that the detachment of the choroid is caused by disturbance of the ligamentum pectinatum which allows the penetration of the aqueous into the perichoroidal space. It is easy to understand that this disturbance would be less likely to occur in the operation of trephining than in iridectomy or Lagrange's sclerectomy. A. J. BALLANTYNE.

(2) **Schur**, of Tübingen, contributes an instance of this unfortunate sequel to trephining. The case was one of chronic inflammatory glaucoma, on which iridectomy had been performed some years earlier. He trephined in both eyes below, doing also a peripheral iridectomy. In the right eye there was some hæmorrhage into the anterior chamber during the operation, followed by a rise of tension. More than four weeks after the operation, and following on an injury to the right eye, or in its neighbourhood, this eye became inflamed and painful. The aqueous was found to be turbid, with a small hypopyon, and there was cyclitic pain. Sections from the enucleated eye showed an ulcer of the conjunctiva near the trephine hole, with a track of infection passing from its base, through the trephine hole, to the iris, ciliary body, and vitreous. The trephine hole was somewhat peripheral, and contained iris and ciliary body.

The author attributes the late infection in this case to the unprotected position of the trephine opening and to the injury. It warns us to protect the wound well by cutting the conjunctival flap thick, and to trephine well forward, so as to avoid incarceration of iris and ciliary body in the opening.

A. J. BALLANTYNE.

(3) In the case reported by **Harms**, of Stralsund, both eyes were trephined, the primary result being good. But four months later, after a period during which irritability of both eyes was complained of, the right eye became deeply injected, pain increased, and an infected ulcer appeared on the conjunctival cushion covering the trephine hole. In spite of energetic treatment, iridocyclitis developed, the eye softened, and vision deteriorated. The ultimate fate of the eye is not known. The author traces the trouble to accidental infection of a traumatic abrasion of the epithelium over the trephine opening. A. J. BALLANTYNE.

VI.—ABDERHALDEN'S REACTION IN OPHTHALMOLOGY.

(1) **v. Hippel.—On sympathetic ophthalmia and juvenile cataract. (Ueber sympathische Ophthalmie und juvenile Katarakt.)** *Bericht der Ophthalmologischen Gesellschaft*, Heidelberg, 1913, p. 26.

(2) **Gebb.—Abderhalden's method in ophthalmological research. (Die Untersuchungs Methoden nach Abderhalden in der Augenheilkunde.)** *Bericht der Ophthalmologischen Gesellschaft*, Heidelberg, 1913, p. 34.

(3) **von Hippel, E.—The ætiology of keratoconus (researches conducted with the Abderhalden dialytic reaction). [Zur Aetiologie des Keratokonus (Untersuchungen mit dem Abderhaldenschen Dialysierverfahren).]** *Klin. Monatsbl. f. Augenheilkunde*, September, 1913.

(1) **v. Hippel**, of Halle, has applied Abderhalden's methods to the investigation of ocular disease.

Abderhalden teaches that every organ has its own specific metabolism which normally does not allow any ferment to be found in the blood which is different in character from the cell proteids, excluding, of course, special secretions. If, however, metabolism becomes disorganised, then bodies, similar in character to the blood proteids, but foreign in nature, are allowed to pass into the blood. The organ then mobilises protective ferments against these substances which metabolise these bodies further and eventually destroy them. These ferments, whose nature is at present unknown, can be detected in the blood by the polariscope and by dialysis. v. Hippel made use of the dialysis method alone. The organ, whose defective metabolism was to be investigated, was prepared in the prescribed manner, and was introduced with serum into a dialysing tube which was placed in an incubator for sixteen hours, and allowed to dialyse into distilled water. If the serum used contained the protective ferment, it assumed a blue or violet colour when boiled for a minute with ninhydrin.

v. Hippel first sought to decide whether the blood of persons affected with sympathetic ophthalmia gave the biological reaction to uveal tissue. Eight cases were examined. Three gave a positive reaction, but five failed to do so. The uvea of oxen was employed as a test, and, as far as possible, all pigment was removed by filtration. The deduction is that in some cases of sympathetic disease a pathological cell substance is present in the uveal tissue. which causes foreign proteid to appear in the blood, and starts a biological reaction. Controls were made in two cases with vitreous, lens substance, liver, placenta, and other substances, always with a negative result. The reaction was obtained only when uveal tissue was employed. Seven cases of perforating injuries were tested, and four of them reacted positively.

v. Hippel is obliged to conclude: that the reaction is of no value in diagnosis, especially early diagnosis; that it does not help the prognosis; and that it throws no light upon the nature of the disease. The reaction is not specific for sympathetic ophthalmia.

Some experiments were also made in cases of lamellar cataract with tetany, and with corneal substance trephined, and of eyes suffering from interstitial keratitis.

T. HARRISON BUTLER.

(2) **Gebb**, of Greifswald, has employed Abderhalden's reaction to determine whether the serum of patients with cataractous lenses differs biologically from the serum of individuals with clear lenses. Using the dialysis method, he obtained in every instance a negative result, but he found the optical reaction much more delicate, and the ten cases of cataract examined all shewed the presence of the characteristic ferment by rotation of the plane of polarisation.

Gebb points out that the serum of old people often gives a reaction with ninhydrin if more than one cubic centimetre of the serum is employed. To avoid this source of error, not more than that amount should be used.

T. HARRISON BUTLER.

(3) Since Siegrist drew attention to the fact that in some cases of keratoconus symptoms are present which might be looked upon as those of "hypothyroidism," further clinical evidence has accumulated which points to the existence in these cases of some disturbance of the glands possessed of an internal secretion. The symptoms, however, are not quite uniform, and no conclusion is yet permissible as to which glands are involved.

In order to throw new light on the subject, **von Hippel**, of Halle, has tried Abderhalden's reaction in suitable cases. The reaction may be described somewhat as follows.—Any disturbance in the metabolism of an organ causes it to send out into the blood antiplasmic substances whose presence leads to the production of protective ferments. These latter have the property of breaking down the cells of the offending organ in a manner similar to that of the peptic ferments—that is to say, their colloids are converted into a dialysable form. One therefore mixes some of the serum of the patient with some of the tissue, say, of the thyroid gland, placing this in a dialyser immersed in water, and incubating in an oven for sixteen hours. If the patient suffers from some disturbance of the thyroid gland, the result of the incubation will be production of certain dialysable substances, whose presence in the water will be detected by suitable reagents. A given blood-serum may be tested against each of the glands in turn, but as several of them may give a positive reaction, it may be impossible to say which is the seat of the primary disturbance.

von Hippel obtained positive results in two cases of typical keratoconus and in a case of an allied kind. In each case the thymus gland was found to be involved; in one the thymus alone, and in the other two the thymus preponderatingly. Next to the thymus, the suprarenals seemed to be of most importance. They led to a positive reaction in two cases. The reaction with thyroid was negative in one, doubtful in one, and weakly positive in one. A doubtful reaction to pancreas was given in one case, and to pituitary in another. Five other cases (belonging to Fleischer and Axenfeld) tested after his paper was completed, seem to give results on the whole similar to these. The author does not seek to draw definite conclusions from these results, but puts them on record, and suggests that they should be followed up by further researches. A. J. BALLANTYNE.

VII.—SURGICAL ANÆSTHESIA.

(1) **Wyler, Jesse S.—Enucleation under ciliary ganglion anæsthesia.** *Ophthalmic Record*, June, 1913.

(2) **Kümmell, R.—Further experiences with scopolamine as a narcotic. (Weitere Erfahrungen mit Skopolamin als Narkotikum.)** *Klin. Monatsbl. f. Augenheilkunde*, September, 1913.

(1) **Wyler**, of Cincinnatti, finds that local anæsthesia by infiltration of the orbit surrounding the muscle and optic nerve fails in inflamed and tender globes, and therefore can only be used in selected cases. Elschnig's method of ciliary ganglion anæsthesia, on the contrary, is applicable in all cases. Wyler's *technique* is as follows:—

The conjunctival sac having been cocainised thoroughly, and a speculum inserted to stretch the canthi, an injection (of 1 cc. of ·9 of a 1°/₀ cocain and ·1 cc. of adrenalin 1 : 1000) is made exactly in the angle of the external canthus close to the bony edge of the orbit, with a Pravaz syringe with a strong needle exactly 5 cm. in length. "If the needle is sharp it penetrates easily about 1½ cm. and then strikes the lateral wall when the direction is turned nasally, following the wall closely until the penetration has been the entire 5 cm. of the needle. Now, by a gentle swaying of the syringe barrel, one can easily perceive that the point is free in the orbit and not caught in the periosteum. The mixture is then slowly injected, which results in a slight protrusion of the bulb. I now remove my speculum and wait about three minutes when I exert considerable pressure over the ciliary body to test the effect of my anæsthetic. If the injection has reached its goal the patient will feel no pain. The operation can now be followed in the routine manner. . . ."

Whether or not this method can be used in other painful ophthalmic operations remains to be seen. Experimental work alone will show whether the nerves and ganglion will recover from the injection; by analogy there is every reason to think that they will. The author considers it less dangerous and more agreeable than general anæsthesia for enucleation. Upon cutting the optic nerve none of his patients experienced a flash of light.

J. JAMESON EVANS.

(2) **Kümmell**, of Erlangen, recites his experiences of the use of scopolamine, along with morphine or pantopon (omnopon), in combination with the employment of a local anæsthetic. His present *technique* is as follows.—On the previous evening a sedative (0·5 gramme of veronal) is given. Next morning, two hours before the operation, the nurse injects 0·6—0·8 c.c. of the scopolamine-pantopon solution (containing 0·6 mg. scopolamine and 4 cg. pantopon to 1 c.c). An hour later the surgeon, according to the state of the patient, either proceeds with the operation or gives a second injection of 0·4—0·6 c.c. Previous to the operation the patient is kept in a dark room in the neighbourhood of the operating theatre. When sufficiently deep sleep has been induced, a local injection of novocain-suprarenin is given, and twenty minutes later, the patient is ready for operation. One case in twenty-eight required the adminstration of a general anæsthetic, and the complications met with were vomiting and great slowing of the pulse and respiration, which lasted for a long time. In one case the respirations were as low as five or six per minute, and oxygen, camphor, and digitalis had to be used. The after-sleep may last from several hours to a whole day. It is admitted that there is much variation in the depth of the effect produced by the usual doses in different individuals.

While the method has one advantage for the operator, in that it enables him to dispense with the mask and gives him a quiet anæsthesia, the disadvantages from the patient's point of view seem to be many, and, on the author's own showing, it is not altogether without danger to life. A. J. BALLANTYNE.

VIII.—OPERATIONS.

8.—Pterygium.

(1) **Terson, A.—On the structure and pathogeny of, and a modified operation for, pterygium. (Sur la structure, la pathogénie et une opération modifiée du ptérygion.)** *Archives d'Ophtalmologie*, mars, 1911.

(2) **White, Daniel W.—A new operation for pterygium.** *Ophthalmic Record*, October, 1911.

(3) **Fromaget, Camille.—The surgical treatment of pterygium. (Traitement chirurgical du ptérygion.)** *L'Ophtalmologie Provinciale*, octobre, 1911.

(1) **Terson**, of Paris, differentiates two types of pterygia, namely, pterygion complete or the centripetal form, and a second more benign and, so to speak, centrifugal form. In pterygion complete, in addition to the elements usually found, there may be added a vascular development, sometimes very intense, giving an angioid aspect and suggesting an angio-fibroma. These are clinically neoplastic, and constitute a tumour, they grow like a tumour, and must be operated on as a recurrent tumour.

The so-called centrifugal form, is one in which the pterygium is triangular, with its base to the cornea, which does not encroach upon that structure. In such Terson has only found a bandelette of sclerosed, and but little vascular tissue. It grows only by its being continually nipped between the lids.

The ætiology of pterygium is far from satisfactory, for whilst noting the frequency of its occurrence in dusty trades, the author has also met with it in hall-porters, teachers, etc., and in occupations with but little chance of exposure to physical agents. He considers, nevertheless, that amongst subjects predisposed to the condition, physical agents constitute the chief cause of the lesion, and suggests that the sclerosing process which takes place, may be compared with the condition which obtains in Dupuytren's contraction of the palmar fascia.

The arthritic and gouty diatheses, especially with chronic alcoholism, are also factors, and, as with pinguecula, there appears to be in some families a hereditary tendency to the disease.

With Brault's theory in mind as to the presence of glycogen in tumours, from the point of view of prognosis, Terson has searched for this substance in large pterygia, but has been able only once to obtain some evidence of its existence.

The author's operation is as follows.—Under cocaine and adrenaline, the pterygium is seized at a reasonable distance from the caruncle with fixation forceps such as are usually employed for cataract extraction ; incisions are made with narrow, sharp scissors, and should form three sides of a rectangle ; the fourth side, horizontally placed and below, is not cut, but forms the base of a flap of conjunctiva, which is afterwards used to cover the area denuded by being sutured to the upper horizontal edge of the wound. The head of the pterygium is removed by dissecting carefully with a fine scalpel, using that part of the blade close to the point, rather than the point itself, in order to avoid leaving behind *débris*. The underlying corneal stroma is lightly curetted, until it appears as transparent as possible, without going too deeply, and is finally cauterised with the galvano-cautery. The pterygium is then removed and the wound closed by drawing up the conjunctiva from below, approximating it to the upper horizontal line of incision. Sutures, usually about three, of fine silk (000) or of finest reindeer-tendon, are used to fix the flap, and should be placed deeply enough to involve the sclera.

The silk sutures will cut out after the sixth day, or if not, should be removed, although not all at the same time ; those of reindeer-tendon are left slowly to absorb. Both eyes are covered for three days.

The chief advantages claimed for the operation rest in the fact that the sutures lie protected by the upper lid, and that a new area of conjunctiva is brought up to take the place of that occupied by the pterygium, whilst the immediate result is stated to be very satisfactory. The author has records of cases of five or six years' standing without a recurrence. If such takes place in the cornea, and does not yield to yellow ointment or Darier's mercurial lanoline, simple and careful curetting, repeated at long intervals, will often suffice to keep the lesion in check.

For the large invading pterygia, if electrolysis and fibrolysine have been unsuccessful, radio-therapy, more particularly radium, should be tried, and, failing these means, a plastic operation similar to that which may be necessary in symblepharon, should be considered. BERNARD CRIDLAND.

(2) **White**, of Pawnee, Okla., transplants the pterygium after it has been detached by incisions (for the nature of which the original must be consulted), which are calculated not to make traction on the pterygium opposite to its circular wave in order to transplant it and do not cause unevenness of the conjunctiva afterwards, and prevent the denudation of the sclera when traction is made in the direction of certain incisions. When the operation is completed the pterygium is buried beneath the undermined conjunctiva. The sclera is securely covered by raised but smooth conjunctiva, which also hugs, but does not overlay, the corneal margin. J. JAMESON EVANS.

(3) **Fromaget,** of Bordeaux, emphasizes the difficulty, with regard to the operative treatment of pterygium, of thorough removal of the thickened head of the growth from the cornea. He denounces the use of the curette; the cautery, which, he thinks, intensifies the scar, and is not curative; and, finally, the method of removal from cornea towards sclerotic. In his opinion, the pterygium should be removed from within outwards, that is by working from base to apex, from sclerotic to cornea. He describes the operation in two steps. He recommends the use of a 1 per cent. solution of cocaine for injecting under the pterygium. The stripping should be performed with a very sharp curved bistoury, used after the manner of a scraper. His incision is in the form of a crescent, approaching and surrounding the limbus gradually like a partial peritomy. The shaving away of the extreme apex of the pterygium must be continued, avoiding punctures, until transparent cornea is reached. A simple dressing is applied to the eye.

Fromaget states that it is not a new procedure. He mentions a number of operators who have used the method in the past. P. A. HARRY.

9.—Trachoma.

(1) **Denig, R.—Transplantation in chronic trachomatous pannus. (Transplantation bei chronischem trachomatösen Pannus.)** *Zeitschrift für Augenheilkunde*, März, 1911.

(2) **Claiborne, J. Herbert.—The operation of excision of tarsus and conjunctiva (Heisrath) in old trachoma, together with demonstration of a new instrument, and a description of a new method of performing it.** *Trans. Amer. Ophth. Society*, Volume XII, Part 3, p. 767, 1911.

(3) **Warschawski, J.—Extirpation of the tarsal cartilage in entropium trachomatosum. (Beitrag zur Frage über die Exstirpation des Lidknorpels bei Entropium trachomatosum.)** *Klin. Monatsbl. f. Augenheilkunde*, Oktober, 1911.

(4) **Coover, D. H.—A résumé of the present operative treatment of trachoma with a description of the author's method of grattage with strips of sterilised sandpaper.** *Ophthalmology*, October, 1912.

(1) **Denig,** of New York, treats cases of pannus trachomatosus by a modified form of peritomy. A piece of the diseased conjunctiva is removed and replaced either by a piece of sound conjunctiva from the other eye, or, more usually, by a piece of mucous membrane from the lip. The results have been very gratifying. T. HARRISON BUTLER.

(2) **Claiborne,** of New York, describes an operation that he considers indicated in the cicatricial form of trachoma, with or without pannus or ulceration and symptoms of irritation or bad sight. It differs from the Heisrath-Kuhnt operation in several points, such as its bloodlessness and the fact that it can be performed in from ten or fifteen minutes with the help of a single assistant. The upper lid is alone attacked. The operation largely centres around the employment of the special clamp shown in Figure 1. The clamp is placed in position beneath the upper eyelid, its spiked prongs lying in contact with the conjunctival surface. The blades are then screwed down by means of the rachet. The clamp is reversed, so as to expose the conjunctiva. An incision is next made following the curve of the forks of the clamp through the

conjunctiva and the underlying tarsal plate. The tarsus with the conjunctiva is dissected up, and, in order to gain slack, the conjunctiva of the fornix is well loosened by further dissection. Sutures are inserted, as shown in Figure 2. The tarsus is now grasped by the forceps, lifted slightly, and cut away with a pair of scissors just above the lines of the sutures. The clamp is then removed. The needles are passed through to the skin surface of the eyelid, the middle ones emerging 4 mm. to 5 mm., and the lateral ones 2 mm. to 3 mm. above the edge of the eyelid. The sutures are tied over small rolls of wet cotton.

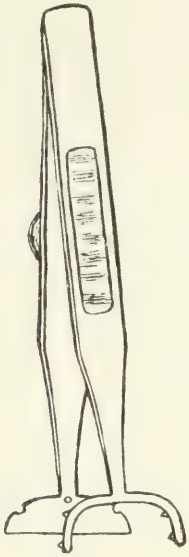

FIG. 1.

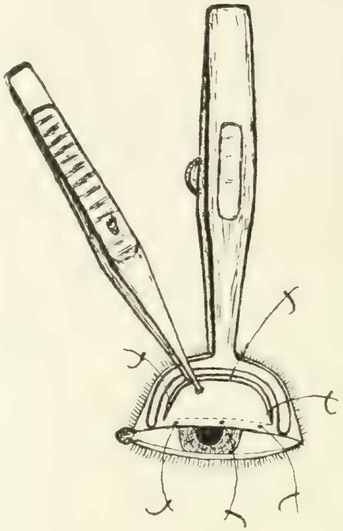

FIG. 2.

SYDNEY STEPHENSON.

(3) **Warschawski**, of Baku-Schwarze Stadt, employs the operation of Kuhnt, with Straub's modification in the application of the sutures (Straub, *Klin. Monatsbl. f. Augenheilkunde*, 1909), and after an experience amounting to 136 operations on 93 persons, speaks most enthusiastically of the results. In the case of the upper lid he has experienced no relapses. Among 13 operations on the lower lid, recurrences occurred in 2.

A. J. BALLANTYNE.

(4) Among the methods reviewed by **Coover**, of Denver, Colorado, in this paper, are those of Knapp with roller forceps, Heisrath's excision of the retrotarsal fold, grattage with tooth brush and gauze, and electrolysis. Knapp's method gives the best results in the forms associated with frog spawn granulations and diffuse hyaline infiltration, but the smaller granulations and those in the fornices are apt to escape. Heisrath's excision of the fold may lead to symblepharon, ptosis, or entropion, and the *technique* is complicated. On the other hand, the author claims that his method is applicable to all forms of the disease. A general anæsthetic is used, and before treatment, the conjunctival sac is thoroughly cleansed with boric acid solution. Number O or OO sandpaper is cut into strips three or four inches by three-quarters of an inch These can be sterilised by dry or moist heat or by soaking in alcohol and burning this off. The lid is thoroughly everted, so as to expose the retrotarsal fold, and a spatula is inserted to protect the cornea. A strip of sandpaper is rolled over the index finger, and with it the

entire conjunctival surface, including the retrotarsal fold, is vigorously scrubbed. After thorough irrigation with sterile water or saline solution, a cold moist dressing is applied, and the eyes are cleansed at intervals, cold applications being employed for five or six hours. The reaction is insignificant. Some exudate is found adhering to the conjunctiva for a few days. As long as there is any exudate or secretion, solution of silver nitrate, 2 grs. to the oz., is applied once daily to the everted lids. After the exudate has disappeared, 1 per cent. ichthyol in vaseline or 1 in 5000 copper sulphate solution is applied once daily until all induration is gone, which takes from four to six weeks. This method has been used in thousands of cases since its introduction in 1906, and the author has never seen corneal complications or other untoward results.

A. J. BALLANTYNE.

IX.—KERATOCONUS.

(1) **Augstein, Karl.—The ætiology and treatment of keratoconus.** (**Zur Ætiologie und Therapie des Keratokonus.**) *Klin. Monatsbl. f. Augenheilkunde*, April, 1913.

(2) **Behr, Carl.—A contribution to the ætiology of keratoconus.** (**Beitrag zur Ætiologie des Keratokonus.**) *Klin. Monatsbl. f. Augenheilkunde*, September, 1913.

(3) **Weeks, John E.—Keratoconus with reports of cases.** *Archives of Ophthalmology*, September, 1913.

(1) The case reported by **Augstein**, of Bromberg, was in a man, 26 years of age. The keratoconus was certainly not of congenital origin, as he was known to have had normal sight at the age of 21. The visual difficulty was of about a year's duration, and during the same period he had observed an increase in the thickness of his neck. Both corneæ were markedly conical, with anæsthesia of the apex of the cone, and with various forms of opacity and epithelial disturbance, which the author describes in detail. Before commencing the treatment, vision in the right eye was "fingers at 1 1/2 metres," and in the left 5/35. Both lobes of the thyroid gland were enlarged, the skin was coarse and dry, and there was some degree of dystrophy of the nails. The blood showed some lymphocytosis. The operative treatment consisted in cauterising, in the right eye, the apex of the cone, and then making three linear extensions from this, downwards and inwards towards the limbus. The anterior chamber was then tapped, and a bandage applied. Thereafter, a thyroid preparation was prescribed for internal use. The opacities disappeared, vision rising to 5/10 in each eye, and the thyroid swelling and dystrophy of the nails and skin disappeared.

The author discusses the recent literature dealing with the ætiology of keratoconus. With regard to his own case, he concludes from the condition of the patient's health, from the result of the blood examination, and from the favourable influence of the thyroid treatment, that the whole group of symptoms is to be attributed to a disturbance of the internal secretions, probably of the thyroid. We have to keep in separate categories the keratoconus associated with congenital abnormalities and the form which is a symptom of a general disease, as in the present case. Here the keratoconus results from a trophic disturbance of the cornea, analogous with the trophic disturbances of the skin, nails, and hair, all of which have the same developmental origin as the corneal epithelium. A. J. BALLANTYNE.

(2) **Behr,** of Kiel, has had under observation for a long time, a woman with microcornea and embryontoxon, combined with marked keratoconus in the right eye, and slight keratoconus in the left. Dimness of vision began at the age of twelve, and from the age of nineteen, she had been deaf and had suffered from frequent spontaneous luxation of the knee, ankle, and shoulder joints. The eyes were highly myopic and presented peripheral chorioretinitis. Externally the scleræ were of a bluish colour, which became intensified when venous congestion was caused by compression of the veins of the neck. The author attributes the colour of the sclera partly to the pigment, and partly to the blood of the uvea, showing through the thin sclera. The choroidoretinitis and deafness are referred to congenital syphilis, evidence of which, was also present in a brother; while the author thinks that the keratoconus, the thinning of the sclera, and the tendency to luxation of the joints, are all due to defective development of the fibrous structures.

A. J. BALLANTYNE.

(3) **Weeks,** of New York, reports fifteen cases of keratoconus, eight in men and seven in women. He considers that the ophthalmometer is the most delicate test in the very early stages, and with this a pulsation synchronous with the pulse may be observed at the apex of the cone in the early stages. In nine cases operation was not required, and Weeks considers that the wearing of suitable glasses has an effect in checking the progress of the complaint. In six cases he operated; his rule being to operate when vision is 8/200 or less. He did an iridectomy upward, or upward and inward, or upward and outward, with the object of reducing tension, and ten days later, he cauterised the apex of the cone. The operation was followed by the use of pilocarpine and a bandage, which was used continuously for three weeks and at night for two months. In one case, which was kept under observation for fourteen years, the cornea remained unchanged. In another, operation was followed by recurrent detachment of epithelium, which Weeks thinks was due to the senile reduction of vitality of the patient, whose age was 54 years. Weeks believes that a large central perforation, whether by a trephine or cautery, may lead to fistula, which is very difficult to treat. ROSA FORD.

X.—MOOREN'S ULCER AND TRAUMATISM.

(1) **Dor, L.—Rodent ulcer of the cornea and traumatism. (Ulcus rodens de la cornée et traumatisme.)** *L'Ophtalmologie Provinciale,* juin, 1912.

(2) **Salva.—Some remarks on L. Dor's report on a case of rodent ulcer of the cornea. (A propos du rapport du Dr. L. Dor sur un cas d'ulcus rodens de Mooren.)** *L'Ophtalmologie Provinciale,* novembre, 1912.

(1) **Louis Dor,** of Lyons, was asked to give an opinion, as an expert, on a case of Mooren's ulcer of the cornea following a traumatism. The patient was a man, aged 38 years, who at the age of fourteen, received an injury to the left eye from a whip, which reduced the vision of that eye to one-fourth of the normal.

In October, 1911, he was struck in the right eye by a piece of stone. He thought nothing of the injury at the time, and his fellow-workmen to whom he showed the eye agreed that it was not serious. On the 28th of October, however, his medical man gave a certificate stating that he was suffering from a corneal ulcer in the right eye that would necessitate his being away from work for at least ten days, and he gave other certificates, dated November 20th, December 23rd, 1911, January 30th and February 23rd, 1912, stating that the corneal ulcer was still active and was resisting every form of treatment.

The patient consulted another medical man on March 2nd, 1912, who reported that the condition was a rodent ulcer of the right cornea, and that, in his opinion and in that of other authorities, the condition did not follow traumatism. He also noted another point in this respect—namely, that on the limbus in the outer part of the right cornea there was ulceration of recent origin.

Louis Dor saw the man for the first time on March 16th, 1912, and found that he was undoubtedly suffering from rodent ulcer of the cornea. Its character had been somewhat changed from the typical condition by the variety of treatment that it had been subjected to. The untreated and uncauterised rodent ulcer presents a circular groove around the circumference of the cornea more or less interrupted, but without any vascular cicatricial tissue.

Dor will not agree that the condition cannot arise from a traumatism. In support he quotes Hayashi, who, in his turn, quotes Gifford, Kiribuchi, and Ogiu. In answer to the question whether the ulcer was due to the injury that the patient received early in October, 1911, Dor could make no definite statement, although he thought it possible. He also said that, as the condition was still in progress, questions relating to the consequences of the accident, depreciation of working capacity, and probable date of return to work could not be answered. The duration of the disease is from two to eight months ; the prognosis with regard to vision is not bad. A non-irritating treatment is the best ; cauterisation is not advised. P. A. HARRY.

(2) **Salva,** of Grenoble, takes objection to Dor's report on a patient suffering from corneal rodent ulcer, as given in *L'Ophtalmologie Provinciale,* of June, 1912 (see above). Dor held that the condition might have been caused by an accident, and quoted a case reported by Hayashi ; he also stated that the disease may last from two to eight months, and with regard to treatment, he advised leaving the condition severely alone.

Salva is of the opinion that the condition was not caused by an accident, and he quotes Morax, in the "French Encyclopædia of Ophthalmology," as well as other writers, who hold that no determining cause is known. Moreover, Salva has been able to cure the condition by thoroughly curetting the ulcer and cauterising its borders with the galvano-cautery, and then by means of a purse-string suture, drawing the resected conjunctiva over the ulcer. Nine days afterwards, the conjunctiva had retracted and exposed to view a completely cicatrised ulcer. The whole inner half of the cornea was leucomatous. Salva mentions another case of rodent ulcer, affecting both eyes, in which the left cornea ultimately became entirely destroyed. In this latter case no operative procedure was attempted. P. A. HARRY.

XI.—ANGIOMATOSIS RETINÆ.

(1) **Pooley, G. H.—Two cases of angioma of the retina.** *Proceedings of the Royal Society of Medicine*, June, 1913.

(2) **Grimsdale, Harold.—Exudation of the retina with dilated vessels.** *Proceedings of the Royal Society of Medicine*, June, 1913.

(3) **Stern, Jakob.—"Angiomatosis" of the retina. (Ueber "Angiomatose" der Retina [sog. v. Hippel'sche Krankheit].)** *Centralbl. f. prak. Augenheilkunde*, August-September, 1913.

(1) We all are aware how very extraordinary the incidence of cases may be in any individual's personal experience, but surely the coincidence which befel **Pooley**, of Sheffield, in seeing two cases of retinal angioma in one and the same day will not be easily matched. Such coincidences tend to show how fallacious statistics may be unless a very large number of cases is in question. In one of Pooley's cases there is a series of angiomatous swellings at the outer periphery of the fundus, connected together by branches, some of which connect two angiomatous masses together, thus forming a plexiform angioma. There are large areas of choroidal degeneration on the peripheral side of the angiomata. In the other case the mass is single, but two distinct sets of retinal vessels are involved. ERNEST THOMSON.

(2) Appreciation of the case reported by **Grimsdale**, of London, depends upon the accompanying plate. The condition present is supposed by the author to be inflammatory in origin.

(3) **Stern**, of Berlin, is able to add one more to the 22 or 23 published cases of this peculiar vascular affection of the retina :

The patient was a man, aged 21 years. At the age of 14 the left eye began to fail and in the course of five years became quite blind and shrunken and was removed. No further particulars could be obtained, nor could the globe be found. Soon after this, the right eye began to fail, and fearing an equally bad result, he came to Berlin (from Russia) to seek advice. V. = 1/3. The field showed a sector defect down and in. In the fundus the chief change is in the area of supply of the superior temporal vessels. Soon after leaving the disc, the artery becomes alternately expanded and contracted ; where it crosses the vein it becomes spindle-shaped and immediately after enlarges greatly in calibre, and sends much enlarged branches into yellowish balloon-like masses. The vessels beyond these masses are not distinguishable as arteries or veins. The vein is enormously distended, and pursues a worm-like course to the yellowish masses above mentioned. The retina in the affected portion has lost its normal appearance. It is entirely transformed into an uneven mass of a colour varying from yellow-white to grey-green. The balloon-like masses were covered with fine red markings which were seen to develop into fine blood-vessels which projected forward into the vitreous. During the three months the patient was kept under observation, the degeneration was seen to extend towards the macula and the vision sank 1/3. Towards the end of this period, a fresh focus was seen to develop in another portion of the retina. Between a small artery and vein several fine vessels (capillaries or newly-formed vessels) were seen to develop ; these gradually enlarged and formed an angiomatous tumour consisting of congeries of fine vessels. Clinically therefore the process consists in the formation of telangiectatic angiomata.

A note is made of the fact that the first to describe this condition and erect it into a distinct disease was Goldzieher in 1899. A. LEVY.

XII.—PULSATING EXOPHTHALMOS.

(1) **Friedenwald, Harry.**—A case of pulsating exophthalmos without bruit. *American Journal of Ophthalmology*, May, 1911.

(2) **Orloff.**—On the treatment of traumatic pulsating exophthalmos. (Traitement de l'exophtalmie pulsatile traumatique.) *Ann. d'Oculistique*, juillet, 1911.

(3) **Lystad, Harald.**—The treatment of pulsating exophthalmus. (Zur Behandlung des pulsierenden Exophthalmus.) *Klin. Monatsbl. f. Augenheilkunde*, Januar, 1912.

(4) **James, R. R. and Fedden, W. Fedde.**—Two cases of pulsating exophthalmos, in which the carotid artery was ligatured. *Lancet*, July 27th, 1912.

(5) **Ginzburg, J.**—The treatment of pulsating exophthalmos. (Beitrag zur Behandlung des pulsierenden Exophthalmos.) *Klin. Monatsbl. f. Augenheilkunde*, Dezember, 1912.

(6) **Rübel, Eugen.** — Ophthalmoscopic picture in a case of pulsating exophthalmos. (Ophthalmoscopischer Befund bei pulsierendem Exophthalmus.) *Klin. Monatsbl. f. Augenheilkunde*, Juli, 1913.

(1) **H. Friedenwald**, of Baltimore, reports an interesting case of pulsating exophthalmos without bruit in the orbit, although at times a blowing sound could be heard along the margin of the sterno-mastoid. The condition was, apparently, of eleven or twelve years' standing when first seen by Friedenwald. There was no history of injury. The patient was carefully examined, medically and radiographically, but very little light seems to have been given by these examinations.

In the author's words—"The case presents a number of interesting features. First, the early age at which the exophthalmos appeared is exceptional, as is also the stationary character (the patient was aged twenty years when first seen). The absence of any sign of congestion about the exterior of the eyeball would indicate a circumscribed vascular derangement, which does not affect the venous outflow from this portion of the eyeball or from the retina. The examination, which could be made without difficulty, did not reveal any palpable growth in the orbit, and yet this cannot be excluded, for such a a growth may be too soft and ill-defined to be palpable. The most curious feature about the case is the absence of all bruit about the orbit, in spite of the marked pulsation." It should be said that the eye, which in diastole was displaced forward about 6 mm., was forced forwards at least 5 mm. to 6 mm. with each pulsation.

Ernest Thomson.

(2) **Orloff** records a case of traumatic pulsating exophthalmos treated by ligature of the ophthalmic vein. On cutting down into the orbit along its external border, the vein, found dilated to the size of a little finger, was ligatured near the superior orbital fissure after temporary resection of the external wall of the orbit (Krönlein's operation). When seen a year later, the patient still had some discomfort from noise "in the ear," but was satisfied with the improvement in his condition.

Orloff refers to four other published cases in which this operation has been performed, and considers that the results are sufficiently favourable to give it a place in the therapeutics of pulsating exophthalmos; but he thinks it would be better to try the effect of gelatine injections before resorting to it.

R. J. Coulter.

(3) In the case reported by **Lystad**, a typical example of pulsating exophthalmos following a revolver injury, a temporarily good result was obtained by ligature of the internal and external carotid arteries and the common jugular vein. The condition recurred, and electrolysis was tried, but with no particular benefit. A year later, the condition was as bad as ever. Lastly, as many as possible of the orbital veins were ligatured through an incision at the upper-inner orbital margin. At first there was great swelling of the lids and protrusion of the eye, and severe pain that could scarcely be relieved by morphia. Three weeks later, however, improvement was obvious, and, ultimately, there was complete recovery from the exophthalmos and its subjective disturbances, but glaucoma developed and became absolute, and the eye was removed. A. J. BALLANTYNE.

(4) **James and Fedden**, of London, report two cases of pulsating exophthamos in which ligature of the carotid was successful in removing the symptoms. Both cases resulted from falls on the head, and must be looked upon, the authors say, as examples of arterio-venous communication, presumably in the cavernous sinus, secondary to a fracture of the base of the skull. In one of the cases the left common carotid was tied, in the other the right internal carotid just above the bifurcation.

The authors remark that while it is impossible to say that these two cases would not have done just as well eventually had they been left to themselves, yet the operation did good service by bringing about a cessation of headache and "buzzing," and thereby allowing the patients to get some much-needed sleep. ERNEST THOMSON.

(5) **Ginzburg**, of Kieff, reports a case of pulsating exophthalmos, and discusses the possibilities of treatment in this condition. His patient received a blow on the left supra-orbital region which led to unconsciousness and other signs of basal fracture. The eye on the injured side presented a double choroidal rupture, but was otherwise normal. On the opposite side, exophthalmos developed next day, and nine days later, pulsation of the globe and pronounced pulsation of the retinal vessels. The other symptoms were anæsthesia of the first division of the fifth nerve, complete immobility of the eye, loss of pupil light reflexes, total blindness, and the fundus picture of division of the optic nerve in the optic canal, all on the right side. The diagnosis was basal fracture injuring the optic nerve in the optic canal and wounding the internal carotid artery and the ocular nerves in the cavernous sinus.

Treatment by digital compression of the carotid was without effect, and ligature of the right common carotid produced no lasting benefit. Complete disappearance of the exophthalmos, pulsation, murmurs, and other symptoms, followed ligature of the superior ophthalmic vein in the orbit. Vision was, of course, permanently lost, and there was a corneal opacity due to ulceration.

In discussing the operative measures employed in this condition, Ginzburg points out that, while ligature of the carotid gives a fair proportion of good results (64·5 per cent. more or less completely relieved), it is not without danger to life. The actual figures vary greatly in the opinion of different authors, but he works out the average number of deaths as 9·9 per cent., and it is higher in cases in which the ligature has been applied on both sides. The other operations recommended are intra-orbital, and of these the most important is ligature of the superior ophthalmic vein. It is based on the principle that ligature of the efferent vessel from an aneurysmal varix has the same effect as ligature of the afferent. While the orbital operations seem to be free from risk to life, they have led, in about 50 per cent. of the cases, to functional derangements, such as corneal ulcer, immobility of the eye, ptosis, optic atrophy, and glaucoma. In all but a few cases hitherto, ligature of the superior ophthalmic vein has followed ligature of the carotid, and it is impossible to say how much of the good result is attributable to the first operation. We are probably justified in claiming that the most certain way to obtain a good result is to combine ligature of the common carotid and of the superior ophthalmic vein on the same side. This brings about obstruction both of the afferent and of the efferent channels of the varix. It is much more rational than ligature of both carotids, and much less dangerous to life. The superior ophthalmic vein should first be ligatured, and the carotid later, if necessary. Ligature of the superior ophthalmic vein is not an easy operation, and it is not facilitated by Krönlein's procedure. It is perhaps better not to attempt the application of a ligature, but simply to clamp the vein in the depth of the orbit, and leave the clamp-forceps in the wound for some days.

A. J. BALLANTYNE.

(6) The pulsating exophthalmos in the case reported by **Rübel**, of Freiburg, had resulted from a blow on the head three and a half years before the date of his first observation. Ophthalmoscopic observation discovered a large number of small white or yellowish-white spots covering the whole fundus from near the disc to far out in the periphery. These spots were, at least in part, situated in the anterior layers of the retina. The arteries were normal, but the veins distended. That the peculiar state of the fundus was associated with the exophthalmos, was proved by the facts that it was present in the one eye only, and that it completely disappeared after successful ligature of the carotid. A coloured picture is given. A. J. BALLANTYNE.

XIII.—POST-OPERATIVE MENTAL DISTURBANCE.

(1) **Hill, Emory.—A fatal case of dementia following cataract extraction.** *Ophthalmic Record*, February, 1911.

(2) **Würdemann, H. V.—Mental disturbances following operations and accidents to the eyes, and the responsibility of the physician as regards prognosis in serious cases.** *Ophthalmology*, October, 1911.

(1) **Hill** records a case of fatal post-operative dementia in a woman, aged 72 years, on whom a combined cataract extraction had been performed. The eye had made an uneventful recovery and the patient had been allowed up before any sign of mental disturbance appeared, six days after the operation. She was never violent, her delirium being happy, although she refused food. Temperature rose to 102° F. and pulse and respiration were correspondingly accelerated. Sixteen days after the operation she died, the cause of death being senile dementia complicated by asthenia, bronchitis, and starvation.

Hill also refers to cases of mild and acute delirium, mostly in those addicted to alcohol, which have occurred at the Wills Hospital, Philadelphia. In one case hyoscine gr. 1·100 hypodermically increased the patient's delirium, and the administration of gr. 1/4 of morphia hypodermically completely controlled it in a few minutes. From his experience, he is unable to find any cause for such cases, nor any means of anticipating them. The use of large doses of sedatives, the adminstration of alcohol to patients who are accustomed to it, getting the patients out of bed and allowing them the use of the eye which has not been operated upon, followed by tonic and supportive treatment, resulted in complete recovery except in the fatal case reported.

J. JAMESON EVANS.

(2) **Würdemann,** of Seattle, mentions a number of cases of hallucinations, of mania, and even of suicide, following operation on or injury to the eyes, or as the result of hearing a bad prognosis. He seems to have met with an unfortunately large number of such cases in his own experience. He discusses the vexed question whether the physician should tell the patient the whole truth, when he takes a pessimistic view of his case; and raises the point that in cases of suicide following the receipt of a gloomy prognosis, the physician might be held partly responsible. A. J. BALLANTYNE.

XIV.—REMEDIES.

(*Third Notice.*)

(1) Lagrange.—The treatment of granular ophthalmia. (Traitement de l'ophtalmie granuleuse.) *L'Ophtalmologie Provinciale*, janvier, 1912.

(2) Kalaschnikow, W. P.—A case of optic atrophy in syphilis after treatment with atoxyl. (Ueber einen Fall von Atrophie der Nervi optici bei Atoxyl-Behandlung der Syphilis.) *Centralbl. f. prak. Augenheilkunde*, März u. April, 1913.

(3) Brav, Aaron.—A case of gumma of the iris after the use of salvarsan. *Ophthalmic Record*, June, 1913.

(4) Fejér, Julius.—External rectus paralysis after alcohol injection for trigeminal neuralgia. (Abducens-lähmung nach Alkohol-Injektion, ausgeführt wegen Neuralgia trigemini.) *Centralbl. f. prak. Augenheilkunde*, Juni, 1913.

(5) Wessely, K.—Method of action of eserine. (Zur Wirkungsweise des Eserins.) *Centralbl. f. prak. Augenheilkunde*, Aug.-Sept, 1913.

(6) Weekers.—Thermotherapy of progressive ulcers of the cornea. (La thermothérapie des ulcères progressifs de la cornée.) *Archives d'Ophtalmologie*, novembre, 1913.

(7) Dor, L.—Apropos the medical treatment of cataract. (Ápropos du traitement médicale de la cataracte.) *La Clinique Ophtalmologique*, 10 novembre, 1913.

(8) Darier, A.—Results of the treatment of retinal detachment. (Twenty years' personal experience). [Résultats du traitement du décollement rétinien (Vingt années d'expérience personelle).] *La Clinique Ophtalmologique*, 10 novembre, 1913.

(9) Fradkine, S.—Syncope caused by "606" in a syphilitic patient affected with Stokes-Adams syndrome and bilateral optic atrophy. (Syncope provoquée par la "606" chez un syphilitique atteint de Stokes-Adams et d'atrophie papillaire bilatérale.) *La Clinique Ophtalmologique*, 10 novembre, 1913.

(10) **Gallenga.** — The treatment of gonococcal conjunctivitis by instillations of antigonococcic serum, and the indications for paraspecific treatment. (Della cura della congiuntivite gonococcica con istillazioni di siero antigonococcico, ed indicazioni della cura paraspecifica.) *Rivista Ital. di Ottal.*,October, 1913.

(11) **Mac Enri, Seaghan P.**—Idiosyncrasy of the eye to atropine. (Idiosyncrasie de l'œil à l'atropine.) *La Clinique Ophtalmologique*, 10 décembre, 1913.

(12) **Ohm, J.**—Contribution to the treatment of miners' nystagmus. (Ein Beitrag zur Behandlung des Augenzitterns der Bergleute.) *Centralbl. f. prak. Augenheilkunde*, Dezember, 1913.

(13) **Purtscher, O.**—The results of Epéron's abortive method of treating infected corneal wounds. (Ueber Erfolge des Epéron'schen Abortiv-Verfahrens bei infektiösen Hornhaut-Prozessen.) *Centralbl. f. prak. Augenheilkunde*, Dezember, 1913.

(14) **Meding, Charles B.**—Subconjunctival injections of cyanide of mercury in ophthalmology. *New York State Journal of Medicine*, January, 1914.

(1) **Lagrange**, of Bordeaux, in a clinical lecture, discusses the treatment of trachoma. Sulphate of copper should be used in all chronic cases without suppuration; in the presence of a discharge, silver nitrate should be used, followed later on by the copper sulphate.

In some cases surgical intervention must be recommended. He divides the operation into four stages: under general anæsthesia the eye is douched with a weak cyanide or sublimate of mercury solution; the next step is to curette the conjunctiva, Lagrange has invented a special "harrow-curette" for this purpose; the mucous membrane is then brushed with a 1-500 solution of sublimate of mercury. Lastly, the conjunctival sac is washed out with a weak antiseptic solution, and powdered with aristol or iodoform. The galvano-cautery may be used in cases with few granulations.

In long-standing cases certain complications arise, of which the commonest is entropion. For this Lagrange recommends Desmarres' operation for the slight cases, and for more serious cases the procedures of Holtz or Snellen are advised: he does not advocate Panas' operation. He mentions the cartilage splitting operation of Gayet and Truc. For corneal complications he suggests peritomy; he never excises a pannus. P. A. HARRY.

(2) It is curious to read in **Kalaschnikow's** paper, an apparently complete *résumé* of the work on and with atoxyl, with the reference that it had been used by English physicians, as the sole mention of all the most important work on this subject. Since it is well-known that atoxyl sometimes produces atrophy of the optic nerves, and since it is extremely unlikely that it will ever be used again in the treatment of syphilis, the paper has not much further practical interest. A. LEVY.

(3) **Brav**, of Philadelphia, saw a patient who had developed a granulomatous iritis six weeks after an intravenous injection of salvarsan administered for marked secondary adenitis, which was effectually cured thereby within a week. Under atropine, leeching, and mercurial inunctions the tumour on the iris and the associated synechiæ disappeared in two weeks. The rapidity of recovery is attributed by the author to the previous use of salvarsan.

J. JAMESON EVANS.

(4) Since the injection of 70 per cent. to 80 per cent. alcohol is becoming

common in the treatment of trigeminal neuralgia, the observation of **Fejér**, of Budapest, is of importance.—A lady, 50 years of age, had received many such injections, and after one of them, carried out through the lower lid, into the neighbourhood of the foramen rotundum, she noticed diplopia, which was due to a paralysis of the external rectus. Apparently, some of the alcohol had caused a peri-neuritis or endo-neuritis. The condition cleared up completely in about two months. A. LEVY.

(5) A few cases of acute glaucoma arising immediately after the instillation of eserine have been reported, and these have led **Wessely**, of Würzburg, to undertake an experimental investigation into the action of this much used drug. When instilled into the conjunctiva, it causes a moderate contraction of the superficial blood-vessels. This occurs both in the human eye and in the rabbit. But when absorbed into the eye, it always causes at first a transitory dilatation, at least in the rabbit. This increased vascularity was always accompanied by increased intraocular pressure. It began about fifteen to twenty minutes after the first instillation—gradually increased for about fifteen minutes, and then sank, so that at the end of another fifteen minutes the intraocular pressure was the same as at the beginning of the experiment. A. LEVY.

(6) **Weekers**, of Liège, writes further on the method of treating progressive ulcers of the cornea by "*chauffage*" as opposed to actual cauterisation.

His first report on the subject appeared in 1910 (for abstract see THE OPHTHALMOSCOPE, Vol. VIII, p. 678), and to the eleven successful cases mentioned then others are now added, making a record of forty-seven cases.

Tabulated according to visual results, a very favourable comparison can be made with those given by Vasek, who employs actual cauterisation :

Loss of an eye	no case
Good projection	1 ,,
Hand movements	1 ,,
Counts fingers	15 ,,
5/60	13 ,,
5/36	10 ,,
5/18	4 ,,
5/12	2 ,,
5/9	1 ,,
	47

Vasek's results in sixty-six cases are by no means so good as the foregoing.

Slight modifications of the original *technique* have been made. Thus the platinum electrode is heated only to the lowest degree of incandescence perceptible in order that it may be approached as near to the ulcer as possible without unduly heating the surrounding healthy cornea. Applications of only one minute's duration are made and repeated two or three times at the same sitting. With this method there is a minimum risk of perforating the cornea, whilst the resulting cicatrisation is much less than that which follows direct cauterisation, as shown by the visual results.

To compare histologically the effects produced on the healthy cornea by the two methods Weekers has experimented on the rabbit's eye. Sections of corneæ are reproduced showing changes :

(1) Immediately after superficial cauterisation.
(2) Ten days after, and (3) three months after.
(4) Immediately after *chauffage*, (5) three hours after, and
(6) After complete healing, time not being stated.

The chief features of 1, 2, and 3 are marked proliferation and cicatrisation of the anterior corneal epithelium and to a less extent of the posterior endothelial layer, and considerable thinning of the corneal stroma. Four and 5 showed œdema of the cornea at the site of *chauffage*, and 6 some slight thickening of the anterior epithelium. BERNARD CRIDLAND.

(7) **L. Dor**, of Lyons, points out some errors in the article by Dalencour, in the October number of *La Clinique Ophtalmologique*,[*] and repeats that he considers his own method the best. He regrets that his *confrères* (and even his friends) seem to have doubted his statements as to improvement in vision, or considered him the victim of an illusion. He has been using his method for ten years, previous to which he tried others to the number of at least ten. Dor's method consists of eye baths for twenty to thirty minutes daily with a solution of iodide of calcium in the nascent state. The formula is as follows :

Desiccated iodide of sodium	4 grammes
Crystallized chloride of calcium	4 ,,
Distilled water	200 ,,

The eye bath employed is a special one with rubber edges made by Lafay, 16, Rue de la Barre, Lyons. Patients must carry out the treatment for several months, or even for several years. Dor has obtained results with Smith's method of subconjunctival injections of cyanide of mercury, but they have been only temporary. In any case his own method is much simpler and more likely to be carried out by the patient. ERNEST THOMSON.

(8) **Darier**, of Paris, criticises the results of the enquiry recently carried out by Vail, of Cincinatti, as to the curability of retinal detachment.[†] By reference to the literature and to his own results, Darier thinks the figure of one cure in one thousand patients, given by Vail, is altogether too low. He considers that the best results are obtained by subconjunctival injections of sodium chloride and mercury bicyanide, and gives details of the method.

ERNEST THOMSON.

(9) The case reported by **Fradkine**, of Paris, is of much interest and importance.—A coachman, with history of syphilis and a positive Wassermann, had already received two injections of salvarsan of 0 gr. 30 without any bad effect. Two minutes after the commencement of the third injection, he became pulseless for several seconds. Under the influence of restoratives he came round and there were no after-effects. The heart was auscultated at the time the faintness came on, and it was found that there was an absolute momentary arrest of heart and pulse. When the heart began beating again, it did so at the rate of only twenty to twenty-two per minute, and the radial pulse was at the same rate. At first the blame was naturally placed on the salvarsan, as such, but repeated subsequent examinations of the patient have convinced Fradkine that it was not the cause. Examination showed that the patient had a permanent bradycardia of forty per minute, entirely uninfluenced by any cardiac accelerator (physiological atropine), a jugular venous pulse of greater frequency than the arterial pulse, a radial pulse isochronous with the cardiac contractions, and marked arterial hypertension. The author regards these Stokes-Adams' symptoms as syphilitic in origin. He explains what happened in the following way.—According to Vaquez and Esmein, crises of this sort are due to anæmia of the medulla through insufficient action of the left ventricle. The latter may be due either to a pause or to slowing. These authors have measured the duration of the ventricular pause which brings about nervous symptoms. Three seconds of cardiac pause corresponds to vertigo, eight seconds to

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[*] *See* THE OPHTHALMOSCOPE, 1914, p. 59.

[†] *See* THE OPHTHALMOSCOPE, 1913, p. 432.

syncope, and fifteen seconds to an epileptic manifestation. The cardiac pause may be either spontaneous or not. An emotion, a fright, a precardial traumatism, or, lastly, an overfilling of the ventricle by increase in the amount of the blood, may any of them cause a temporary confusion (*désorientation*) in that important part of the ventricle, the bundle of His. This last, says Fradkine, is what happened in his case. The entrance of 20 to 30 cubic centimetres of liquid into the circulation disturbed the balance thereof, and determined a pause of the ventricle, to which the patient was predisposed. Although the heart had resisted the two previous injections, it yielded to the third. ERNEST THOMSON.

(10) The clinical investigations of Colombo have shown the value of the repeated instillations of antigonococcic serum as an adjuvant to the usual classic treatment of gonorrhœal conjunctivitis. The result of the serum is shown by the rapid attenuation of the symptoms, the speedy resolution of the phase of purulent exudation, and the diminished length of the secondary stage. Especially is there a reduction, in cases thus treated, in the inflammatory œdema of the lid and chemosis of the conjunctiva. There is no corresponding reduction of the number of germs, and the observer is led to believe that their toxicity is reduced by application of the serum. It is no inconsiderable advantage of this treatment that it may be confided, without fear, to unskilled hands.

When the course of gonorrhœal ophthalmia is marked by a fibrinous or pseudo-membranous exudate, **Gallenga**, of Parma, has found that the subcutaneous injection of antidiphtheritic serum is followed by good results, and he recommends this paraspecific treatment, following it up, as soon as the purulent form is established, by the usual treatment indicated above.

HAROLD GRIMSDALE.

(11) The case reported by **Mac Enri**, of Galway, Ireland (one finds it difficult to believe that the name of the author is rightly spelt) is an ordinary one, of a kind fairly frequently met with, in which the use of atropine is followed by pain and swelling of the lids. S. E.

(12) The experiments, made by **Ohm**, of Bottrop, upon the treatment of miners' nystagmus are based upon the observation that large doses of alcohol suppress the movements. He therefore sought for alcohol derivates, particularly of the higher alcohol series, and found marked benefit from the use of alendrin which is a carbaminester of $\mu\mu$ dichlorisopropylalcohol acid also from the use of adalin which is bromo-diethylacetethylcarbamide. The best dose of alendrin was 0·25 grm. at intervals of one hour for four to eight hours, and of adalin 0·5 grm. two or three times a day. A. LEVY.

(13) Epéron's abortive method consists in painting the surface of a corneal ulcer with a 20 per cent. solution of zinc sulphate.

Purtscher, of Klagenfurt, has tried this method, and is very pleased with it. True it is painful and cocaine does not prevent the pain, but still it occasionally renders unnecessary the use of the galvano-cautery, while the resulting scar is much less. It will be remembered that at the recent meeting of the International Medical Congress Professor Sattler advocated the use of ethylhydrocuprein in these conditions.

Some day, perhaps, a great German clinician will discover the use of pure carbolic acid in these cases, and then these other drugs will not be necessary.

A. LEVY.

(14) The results obtained in inflammatory diseases of the eye at the Amritsar Hospital, India, by Colonel Henry Smith by the subconjunctival injection of from ten to twenty drops of a 1 : 4,000 solution of mercury cyanide have led to the "awakening" of **Charles B. Meding**, of New York City, to

the value of this method of treatment. He is evidently deeply impressed with what he has seen in India. He tabulates nine inflammatory conditions of the eye, for the relief of which a total of 182 injections were practised. Of that number "good results" accrued in 118, and "no result" in 9 only. He does not commit himself to an opinion one way or the other with regard to the remaining 55 cases, almost one-third of the whole.

SYDNEY STEPHENSON.

CORRESPONDENCE.

[While THE OPHTHALMOSCOPE will at all times welcome correspondence from its readers, the Editor does not hold himself responsible for any views expressed in this column.]

SCLEROTOMY v. SCLERECTOMY.

To the Editor of THE OPHTHALMOSCOPE.

DEAR SIR,—I have read with great interest Mr. H. Herbert's article entitled "Sclerotomy *versus* Sclerectomy," in the January issue. The last sub-division of the article is headed "The Ideal Operation," which Mr. Herbert proceeds to describe as follows:—"The ideal operation must provide a linear filtering cicatrix, or the nearest possible approach to it, with a minimum of risk ..... What is required ordinarily is a simple linear puncture, parallel with the corneal margin, in some way kept from healing firmly. Iridectomy, being needed only to keep the iris free from the wound, should be avoidable at least in cases where the anterior chamber is not exceptionally shallow and where the pupil can be kept fully contracted by eserine. . . ."

I think if Mr. Herbert will try Aqueo-plasty he will admit that his ideal has been realised. I can assure him that in no case will he have to dread the effects of prolonged hypotony. The only drawback I have found is a tendency for the silk to come out in some cases—for which, I think, I have chiefly myself to blame.

With him, I lament the scantiness of "material" which restricts opportunities, but I think we are led by this circumstance to be at least a little conservative.

21, CARLTON CRESCENT,
SOUTHAMPTON,
2nd February, 1914.

Yours faithfully,
ARTHUR ZORAB.

XIIth INTERNATIONAL CONGRESS OF OPHTHALMOLOGY.

To the Editor of THE OPHTHALMOSCOPE.

DEAR DOCTOR SYDNEY STEPHENSON,—I beg your pardon; in your excellent OPHTHALMOSCOPE (1914, p. 123), there is a slight mistake.

In my *Centralblatt*, December last, I did not advise my co-religionists to absent themselves from the XIIth International Congress of Ophthalmology, but my colleagues all over the world. Except myself, within a few days all the correspondents of four nations resigned and several of the others—all these gentlemen being of Christian denominations, with the exception of a few Shintoists.

Promptly, within less than a fortnight, the Russian authorities withdrew those restrictions for reserving the Congress.

Great is the power of justice!

Very truly yours,
JULIUS HIRSCHBERG, M.D.

BERLIN, N.W. 6.
26, SCHIFFBAUERDAAM.
2nd February, 1914.

A NEW OPERATION FOR STAPHYLOMA OF THE CORNEA.

To the Editor of THE OPHTHALMOSCOPE.

DEAR SIR,—With reference to the able *résumé*, in your January issue, of the description of Dr. Attias's useful operation for the reduction of staphyloma of the cornea, may I add the observation that it enhances the value of the result obtained if care is taken to plan the flaps so that their apices do not meet together at one common point.

This was described by me in the record of a series of similar operations published, with illustrations, in the *Ophthalmic Review*, Vol. XII, p. 249.

In writing this I do not wish in any way to detract from the ability of Dr. Attias's original work, but common needs not infrequently evoke repetition of the same remedies, and this is an example of it.

Yours truly,
KENNETH SCOTT.

7, MANCHESTER SQUARE, W.
January 23rd, 1914.

BOOK NOTICES.

Defective Ocular Movements and their Diagnosis. By E. and M. LANDOLT, Paris. Translated by A. ROEMMELE and E. W. BREWERTON. Pp. 97. London: Henry Frowde; and Hodder & Stoughton. Price, 6s. net. 1913.

The scheme of this attractive little book is admirable, the first twenty-six pages being devoted to the anatomy and physiology of the ocular movements, and to the clinical use of prisms, while the remainder of the book deals with the various kinds of strabismus, their diagnosis and their ætiology. Unfortunately, there are a few inaccuracies that we point out with a view to their correction in a future edition.

On page 14 we are led to infer that the intra-ocular distance in adults is 64 mm.; in this country, at any rate, the distance is more usually 60 mm. But we congratulate the author on his ingenious approximate rule for showing the relationship between metre angles and ordinary angles in degrees. We must point out, however, that it is not absolutely accurate, as 12 $sin\ \theta$ is not equal to $sin\ 12\theta$. In the table of such relations given on page 15 with a base line of 64 mm., 12 $m.a. = 22^\circ\ 35'$ not 22°, while if the base line be 58 mm., 12 $m.a. = 20^\circ\ 22'$ not 20°. On page 20 the figures 1·5 should be substituted for 1·57 in the sentence, "If this refraction index were 1·57, the angle of deviation would be half the open angle." On page 21 the third paragraph would lead the reader to infer that spherical glasses exercise no prismatic effect: this should be transferred to the next section headed "The Prismatic Effect of Spherical Lenses." Percival's formulæ, quoted from his "Optics," are in his "Prescribing of Spectacles" given in a much more convenient form in dioptres. On p. 24 if $p = \infty$, m and k do not both disappear as stated; for tan. $x = \frac{d}{f}$ refers to the prismatic eqivalent of a decentred lens, whereas tan. $x = \frac{d}{f + k}$ refers to its deviating effect upon the eye behind it. On p. 25 there is presumably a misprint in Imbert's formula, $d = {\cdot}006^\circ \times lD$ for ${\cdot}06^\circ \times lD$; more accurately it is $3' {\cdot}4376 \times lD$. On pp. 30 and 31 and elsewhere a tangent is said to be equal to a distance; a tangent is a ratio, a percentage not a length.

Landolt does not give the diagnosis as simply as Maddox of the paralysis of a single ocular muscle, but the diagrammatic chart on pp. 45 and 46 is most useful, although we cannot understand how the paralysis of an oblique muscle can show a torsion of about 45° with such a marked vertical displacement. We have always found that the fixation direction which caused the greatest torsion caused the least vertical displacement.

The last thirty pages of the book are excellent, and we cannot praise too highly the method adopted—of beginning with the symptoms and then leading up to the disease which causes them. A patient does not come with the name of his disease asking for the symptoms, but he relates to us his symptoms, and from them and from the careful examination advised in this little book, we should be able to diagnose the disease and to deduce the nature and seat of the lesion.

Eye Symptoms in Raynaud's Disease: A literary criticism from the ophthalmic aspect. (Die Augen-Symptomen der Raynaudschen Krankheit von ophthalmologischer Seite: literarisch kritisch-bearbeitet.) By DR. E. E. BLAAUW, Buffalo, New York, U.S.A. *Sammlung Zwangloser Abhandlungen aus dem Gebiete der Augenheilkunde*, Bd. IX, Heft v. 1913. Halle a. S.: Karl Marhold. Price, M. 1.

This is a *brochure* in which the author endeavours to show that in no single case has it been proved that Raynaud's disease is the cause of spasm of the visible retinal vessels. In a case of his own the author's attention was drawn to symptoms which, in his opinion, might have been caused by Raynaud's disease, and in seeking to support this opinion, the literature of the subject was consulted. This revealed the fact that although this disease had engaged the attention of neurologists, clinicians, dermatologists, and surgeons, little was to be found touching the ophthalmological side of the matter.

The case was that of a somewhat delicate woman in whom eye symptoms (pain and diminished visual acuity) occurred coincidently with coldness of the fingers and toes, which at the same time became quite white, these two groups of symptoms always occurring together, especially in cold and damp weather and after sea bathing. Treatment was of no avail. The author did not at any time see any pathological changes in the fundus. Taking into consideration the fact that these symptoms always occurred together, he considered himself justified in attributing the eye symptoms to Raynaud's disease.

A case by Raynaud has gained considerable celebrity on account of the renown of the recorder. This was one in which eye symptoms manifested themselves during the attacks of coldness and pallor of the extremities. The ophthalmoscope showed that the central retinal artery and its branches were narrower at their origin than in their further distribution, and marked pulsation of the veins was present on the disc. The author goes on to show that this condition was owing to arterio-sclerosis—endarteritis, and in attributing this to Raynaud's disease, a wrong conclusion was drawn, because the pathological conditions of the fundus, as observed by the ophthalmoscope, were not so well-known as they are to-day. Many well-known clinicians have never seen changes at the fundus, and although a few cases have been recorded in which ophthalmic surgeons claim to have seen changes in the calibre of the retinal vessels during an attack of coldness and pallor of the extremities, the author says there is no proof that these symptoms have a common cause.

After reviewing the literature, he says that barely ten cases have been recorded in which eye symptoms occurred in Raynaud's disease, and he deplores the fact that not in any single one of these cases is the ocular condition described by a competent ophthalmic surgeon, and such description as is given is superficial and inadequate. He is quite convinced that in support of the dictum that contraction of the visible retinal vessels occurs in Raynaud's disease proof is wanting, although the possibility is admitted. A list of references is given.

The *brochure* is interesting, and not the least so from the remarks of the author on incompletely recorded cases. GEORGE H. OLIVER.

The Royal London Ophthalmic Hospital Reports. Edited by J. HERBERT PARSONS. Volume XIX, Part II, January, 1914. London: J. and A. Churchill, 7, Great Marlborough Street. Price, 7s. 6d.

This volume of the Royal London Ophthalmic Hospital Reports appears to be unusually bulky, mainly owing to the number of interpolated family trees to illustrate an important paper by C. H. Usher, "On the inheritance of retinitis pigmentosa." The volume includes other communications by the late E. Nettleship, R. A. Greeves, the Editor, and A. C. Hudson.

THE OPHTHALMOSCOPE DIARY.

	1914.	
Section of Ophthalmology: (Combined Meeting) Royal Society of Medicine.	March 4th	London.
Midland Ophthalmological Society	April 7th	Birmingham
Ophthalmological Society of the United Kingdom	April 23rd to April 25th	London.
French Ophthalmological Society	May 4th	Paris.
Section of Ophthalmology: Royal Society of Medicine.	May 6th	London.
Section of Ophthalmology: Royal Society of Medicine.	June 10th	London.
Oxford Ophthalmological Congress	July 8th to July 10th	Oxford.
British Medical Association: Section of Ophthalmology.	July 29th to July 31st	Aberdeen.
International Congress of Ophthalmology.	August 10th to August 15th	St. Petersburg.

THE

OPHTHALMOSCOPE.

A MONTHLY REVIEW OF CURRENT OPHTHALMOLOGY.

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ORIGINAL COMMUNICATIONS.

REPORT ON TWENTY-SIX SCLERO-CORNEAL TREPHININGS (ELLIOT'S OPERATION) FOR GLAUCOMA.*

BY

WENDELL REBER, M.D.,

PHILADELPHIA, PA., U.S.A.

I THINK it may safely be stated that about fifteen years ago, the glaucoma question seemed to have resolved itself into the dictum, that inflammatory forms of glaucoma were to be attacked by iridectomy, while chronic non-inflammatory glaucoma lent itself more to drug than to operative treatment. By this is meant that acute and sub-acute, or congestive glaucoma, not promptly amenable to drug treatment, became frankly an operative condition ; while on the other hand, chronic simple non-inflammatory glaucoma so often failed of arrest or improvement under iridectomy, that the profession felt itself driven to miotics locally, combined with eliminative drugs and methods internally The last resort in such cases, was, naturally, iridectomy again, which conferred but a temporary respite from blindness, as shown by Posey and Zentmayer (*Archives of Ophthalmology*, July, 1895).

Pessimistic as it may seem, the profession had pretty well settled down to this attitude in the matter, when the advent of the ocular tonometer, and the advocacy of the new filtration operations roused interest in the question anew. That this interest has by no means abated, but has steadily increased, is strongly evidenced by the voluminous literature devoted to glaucoma. Three phases of the subject have dominated the field, namely, tonometers and tonometry; study of normal and abnormal filtration; and the description of all manner of new filtration operations. The year 1911 brought forth a literature of 150 titles, while 1912 surpassed it with 160 titles, and 1913 thus far with its 144 titles for nine months bids fair quite to overtop its predecessor. The largest and clearest consideration of the whole matter is set forth in Col. Elliot's recent volume on sclero-corneal trephining, or sclerostomy, as he now prefers to call it. It is a masterly presentation of the whole operative phase of the glaucoma question, judicial in tone and worthy of the closest study by every thoughtful ophthalmic surgeon.

In this communication, as the title indicates, no reference will be made as to the theories of the origin of glaucoma, nor of its diagnosis, the operative treatment of the condition being our chief concern.

Assuming that the surgeon has decided in a given case of glaucoma that operation is indicated, his choice lies between the classic iridectomy of von Graefe, on the one hand—or one of the filtration operations, on the other.

The Case for Iridectomy.

Those who hold to iridectomy pure and simple as a complete and sufficient means for the control of the glaucoma process, claim for it :

1. Ease of execution ;
2. Short duration of the operation ;
3. Prompt closure of the wound, leading to
4. Lessened liability to infection ;
5. Freedom from complications in the healing (formation of synechiæ) ;
6. Permanency of result.

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*Presented to the American Academy of Ophthalmology and Oto-Laryngology at the Chatanooga meeting, October 28th, 29th and 30th, 1913.

These points may be considered seriatim.

1. *Ease of Execution.*—That iridectomy in the presence of glaucoma is easy of execution by the skilled operator is not freely conceded by all surgeons. The psychic state of the patient is of itself no small bar to a successful issue. The elevated general blood pressure that goes with this psychic state naturally begets an intensified intra-ocular pressure with greater forward displacement of the iris and lens. More than usual shallowing of the anterior chamber results in increasing the difficulties attending the corneal section. Dexterous users of the keratome hold that a depth of 1½ mm. in the anterior chamber is sufficient to permit perfect introduction of the keratome. In a perfectly quiet patient this contention will hold, but every surgeon will admit that the average glaucoma patient is an unruly one, and that a finely placed corneal section, either with the keratome or a very narrow Graefe knife, is the exception rather than the rule. Granting, however, for the sake of the argument, that an ideal corneal section has been secured, the sudden gush of aqueous at this point is fraught with great danger, for if the lens and iris are released and come forward too suddenly, dislocation of the lens is more than likely and gross intra-ocular hæmorrhage highly favoured. . Assuming for further argument, that neither of these difficulties has arisen, the negotiation of the iridectomy in such cases is more painful than in other iridectomies (such as in cataract). Orbicular and extra-ocular spasm at this juncture is pregnant with all manner of dire possibilities, such as presentation of the lens in the wound, vitreous protrusion, or destructive intra-ocular hæmorrhage.

To push the argument further, all these steps may have been successfully and easily accomplished, completing the operation, when a ruptured choroidal or ciliary vessel will invalidate the whole procedure. A case in point I well remember occurring in my early practice.—A woman of 55 years, in fairly good health, had gradually lost all sight with a progressive glaucoma of the low relapsing type. Complete secondary cataract had developed in both eyes. The candle fields showed marked limitations. There had been steady advance of the process notwithstanding the most painstaking drug treatment for years. The tension was *plus* 2. After consultation with a *confrère*, it was decided to operate upon both eyes at the one sitting. The anterior chambers were of fair depth and a good sized iridectomy was easily done on both sides. Immediately after excision of the iris in the first eye the lens presented in the wound necessitating its delivery. This also was comparatively easy, and the eye was promptly closed and a bandage applied. In the second eye also the lens presented immediately following the excision of the iris and again the lens was easily delivered. Just at this point a tell-tale crimson blotch, about half inch in diameter, appeared on the surface of the bandage of the eye first operated, directly over the site of the wound. Nevertheless the left eye was promptly closed and a snug bandage applied, but in about ten minutes this bandage also became completely blood-stained. The direst complication we are called upon to face had occurred in both eyes, namely, expulsive choroidal hæmorrhage. In the light of my present day experience, I am of the conviction that a correctly performed sclerostomy (or trephining) would have averted the calamity and given the woman a better chance with a cataract extraction later. Some would hold that preliminary sclerotomy would have been of great value in this case, and no doubt it would, but wisdom after an operation does not avail the patient much.

2. *Short duration of the operation.*—It must be conceded that iridectomy is a much shorter operation than trephining or sclerostomy, but, in our judgment, this is more than overbalanced by the greater operative dangers attending iridectomy.

3. *Prompt closure of the wound.*—After the usual iridectomy, the wound will close in twelve to twenty-four hours, while after Elliot's operation several days frequently elapse before the conjunctival flap has completely sealed itself, so that the weight of argument would seem to be with iridectomy. Yet, in nearly 900 cases, Elliot has not had a single suppuration of the globe, or serious iridocyclitis attributable to the operation, which would go to show that when the conjunctiva is properly dealt with, it affords complete protection to the important structures it covers. This also meets claim No. 4 of the advocates of iridectomy, namely, the lessened liability of infection after that procedure.

Mention should here be made of a few scattered cases recently reported in the literature of late infections after trephining (two to eight weeks after operation), but careful study of these reports seems to indicate that the conjunctiva was *not* properly dealt with as to size of flap, and that, therefore, late infection was favoured

5. *Freedom from complications in the healing.*—This aspect of the case has been ably handled recently by Col. Elliot in THE OPHTHALMOSCOPE for October, 1913, and I quote from his observations. He says: "I have been asked why a 'quiet iritis' is so much more often met with after trephining than it was after the old iridectomy. I would, first, reply by another question: Is it really the case that it is more frequent? It is far from an infrequent experience to see the iris tied down after an iridectomy for glaucoma. I suggest that surgeons should carefully watch their cases for the occurrence of the so-called 'quiet iritis' with a view to establishing its relative frequency under the old and under the new operations. It is an old charge that we see only what we look for, and I think that most surgeons will agree with me that many deductions from statistics would require profound modification were the notes taken daily on a schedule which reminded the over-worked observer of the possible, and still more of the probable, complications he has to be on the look-out for."

This quotation from one who has performed nearly 900 sclerostomies (trephinings) and whose reputation as a keen clinical observer has become world-wide, brings to my mind the contention I have recently made that about 40 per cent. of all cataract eyes that are operated on will show a slow insidious iritis—which Elliot so aptly terms "quiet iritis." It is by no means a frank condition, and as he trenchantly insists, is seen only "*when looked for.*" As to how much it affects the final result in iridectomies or cataract extractions is just now beside the question. The outstanding fact is that it frequently occurs after all operations on the anterior ocular segment, and is probably induced by alteration in the properties of the aqueous humour.

6. *Permanency of result.*—Those who cling to von Graefe's iridectomy as the ideal operative treatment, point very justifiably to the hundreds of cases in which patients who have been operated on many years previously still retain and enjoy all the beneficial results of the operation. Only recently there came under my observation a woman of 55 years on whom the late Dr. Harlan did a most beautiful double iridectomy twenty-three years ago. The coloboma was of about 6 mm. width in both eyes, and extended well back into the angle of the anterior chamber. If every iridectomy for glaucoma were equally as beautiful and productive of results, the modern filtration operations would never have been devised. We have seen too many exceptions to this rule to accept any such postulate. The partisans of iridectomy, too, are fond of arguing that very few, if any, reports of trephining are more than five years old, and they question what will be the status of these trephined eyes five or ten years hence? It would seem a reasonable rejoinder, that seeing that such

eyes are in good condition as to filtration and function two to five years after trephining, the assumption is justifiable that they will continue to filter and to function quite as well five to ten years hence, provided, of course, that their possessors remain in ordinary good health ; so that comparisons as to permanency of result must remain unsettled for at least five to ten years longer.

The case against Iridectomy.

The case against iridectomy may be summed up in the following complications at the time of operation, any of which may be encountered by the best of surgeons :

1. Transfixation of the iris.—This will happen at times in cases of shallow anterior chamber in spite of every precaution.

2. Widespread separation of the root of the iris, a not unusual incident with an unruly patient.

3. Partial or complete dislocation of the lens. It is held in some quarters that this complication is due to a lengthened operation. While I am far from saying that this unwelcome presentation will not almost surely occur with a bungler, I also maintain that a sudden gush of aqueous may easily allow the forward displaced vitreous to dislodge the lens from its attachments and drive it between the lips of the wound. Three times this accident has occurred to me, and each time after as smooth an iridectomy as any operator could wish for.

4. Intra-ocular hæmorrhage at the time of operation, or almost immediately following it, is one of the gravest complications that attend iridectomy. Indeed, it is our feeling that any operator who makes an 8 mm. to 10 mm. opening in the cornea, not only suddenly releases the pressure on the intraocular blood-vessels at the time of incision, but leaves these weakened vessels without any particular support until the corneal wound closes (24 to 48 hours). This objection obtains as much with the Lagrange as the von Graefe method. Elliot remarks that it was a very present danger in the days of iridectomy, pure and simple.

5. *Unruly patient.*—When we consider the panicky state of many glaucomatics, and the erratic behaviour of their blood pressure, it will readily be seen that all manner of nasty consequences may ensue. If one elects to operate under local anæsthesia, the patient may do irreparable damage by struggling and moving the head at an inopportune moment. Most surgeons aim at avoiding these difficulties, and the pain incident to the gush of the aqueous, by resort to general anæsthesia, but even this is not an absolute guarantee. I recall a patient who was supposedly under the influence of a general anæsthetic, and yet rose to an almost upright position on the operating table just as I was about to complete the corneal section. This was quickly done in spite of the fact that the iris was driven before the knife, but almost immediately the lens presented in the wound and was followed by vitreous. On the other hand, the danger of vomiting after general anæsthesia is too likely and grave an eventuality to be lightly regarded. If an operation could be devised that would "be easy of performance, devoid of serious risks and at the same time offer reasonable prospects of improvement or cure in acute or chronic glaucoma," it would soon be acclaimed as the ideal operation. Whether one of the modern filtration operations or some other one yet to be devised will fill this requirement time alone can show.

This much at least can be claimed for Elliot's sclerocorneal trephining.—That it is (1) relatively easy of performance ; (2) less risky than von Graefe's or Lagrange's method, and (3) reasonably promising of improvement or cure in both acute and chronic glaucoma.

Cases.

At the Oxford Ophthalmological Congress two years ago, Colonel Elliot gave many demonstrations of his operation on animals' eyes, and it was my privilege to do a number under his direction.

Soon after my arrival home, a suitable case presented itself in my service at the Polyclinic Hospital. The patient, a man of 65 years, suffered from chronic congestive glaucoma in the right eye and non-inflammatory glaucoma in the left eye. The tension in the right eye was *plus* 4, and it was a sightless globe, the patient submitting to operation for relief of pain only. The anterior chamber was practically abolished, the pupil 5½ mm. in diameter, and the lens so hazy that no fundus view could be obtained. There was marked fulness of the deep ciliary vessels and great ocular tenderness. Under local anæsthesia, combined with morphine and scopolamine internally, I did an Elliot's trephining and gained entrance to the upper angle of the anterior chamber without any difficulty. The eye immediately became painless, quieted down, and healed rapidly. I was rather struck, however, with the prolonged localised reaction just above the cornea. It occupied a triangle about 5 mm. in dimension. From subsequent cases I learned that this is not unusual and need occasion no alarm. Two months later the tension was normal and the eye absolutely quiet and painless. The only evidence of the operation was the slight elevation of the conjunctiva at the site of the sclerostomy, which, as Col. Elliot has pointed out, I found would pit very readily on slight pressure with a probe.

Attention is directed to the fact that no difficulty was experienced in performing the operation under local anæsthesia, nor did the patient have any special discomfort during the healing process.

Since then I have trephined twenty other eyes, all of them under local anæsthesia, some with and some without morphine-scopolamin aid.

Case No. 2 occurred in a 55 year old Pennsylvania German, whose right eye had developed acute inflammatory glaucoma some five years before I saw him. For this state of affairs in his right eye he had had an iridectomy performed at the height of the inflammation (so he stated), but evidently the surgical intervention had come too late, as there was no gain in vision after the operation. At the time he was admitted to my service at the Samaritan Hospital, his vision in the right (previously operated) eye was a poor 2/60 eccentric. There was no central vision at all. He stated that four days before admission, his left eye, which had always been good, began to grow painful, with clouding of the vision. Vision on entrance equalled 6/60. The cornea was hazy ; the pupil 5 by 5½ mm. irregularly horizontal; anterior chamber very shallow. No fundus view was obtainable. The tension was 25 mm., there was great ciliary tenderness and photophobia, with high grade ciliary congestion. The patient was promptly mercurialized, miotics were ordered, and he was sweated under pilocarpin. In spite of these measures, his vision fell off to 6/20. At this point he submitted to a trephining done under local anæsthesia combined with morphine and scopolamin. Relief of all the symptoms was prompt, and in two weeks his vision rose to 6/12, and the tension fell to 18 mm. The ophthalmoscope revealed a cup of about 1½ mm. depth.

If I have dwelt on these two cases in detail, it is because they were both of the inflammatory variety, in which iridectomy has been looked upon as the sheet-anchor of treatment. In both of them, sclerocorneal trephining proved itself curative. In case No. 2, the parallel is even more striking, as iridectomy had failed of its purpose in the right eye.

CaseNo. 3, was also an inflammatory case, occurring as a post-traumatic glaucoma in the left eye of a 30 year old man in perfect health. Four years previously, he had been struck in the left eye by a piece of wood, in consequence of which traumatic cataract had developed and glaucoma later supervened. It finally took on the features of a relapsing congestive glaucoma, the pain being sufficient to disqualify him for his work. The right eye was normal in all respects. The left one was divergent 20 degrees, showed a marked pericorneal injection with slight generalized corneal haze, shallow anterior chamber—several old iritic adhesions and an opaque lens. The tension was 30 mm. and the eye had not even light perception. Trephining was done on October 16th, 1912, to relieve pain only. Local anæsthesia and morphine internally sufficed to make the operation painless. To-day (one year later) the patient reports, stating that the eye has remained perfectly quiet, and that he has worked steadily at making small patterns all through the year. The tension is 20 mm. and the conjunctiva pits deeply on pressure over the trephined spots, showing plainly that filtration is going on perfectly.

The remainder of this series are all non-inflammatory cases of the type with which everyone is familiar. They will be briefly recorded:

Case 4, October 20th, 1912.—C. H., aged 65, male, carpenter, states that up to three years ago he saw very well with his glasses, but latterly his sight has been growing dim. The patient was said by the physician who recommended him to be in good health in every way. Corrected vision equalled 5/30 in each eye. Both eyes were free from any signs of inflammation and no history of an inflammation in either eye could be elicited. The anterior chambers were of fair depth, the media were clear, and the picture of chronic non-inflammatory glaucoma was complete. The tension was 30 mm. in each eye and the visual fields were badly cut down. One week after trephining, the vision in each eye was 5/10 and tension 20 mm.

This was the first case in which I had the opportunity to use the trephine attached to the dental engine (to be described further on). The quickness and perfectness of its action pleased me very much. With it I used a 2 mm. trephine, and on withdrawing it, after getting through the sclera, the iris prolapsed into the wound in both eyes, and a broad iridectomy was secured. Col. Elliot's experience that a clean sharply-cut disc is likely to give much better results has been borne out in my own few cases, and for this reason I believe a machine-controlled trephine will eventually become the instrument of choice. Further, I have the feeling that when possible it will be well if we can combine a moderate-sized iridectomy with the sclerostomy, the more so as the small opening in the sclera does not predispose to the nasty accidents that frequently attend iridectomy by von Graefe's method.

Case 5.—C. C. F., a mulatto, aged 44. Iridectomy left eye one year previously for acute glaucoma. Vision right eye 20/50. Left eye light perception only. Tension right eye 30 mm., left eye 25 mm. to 28 mm. Marked excavation both optic nerves. General blood pressure, systolic 168, diastolic 120 mm. Trephining done both eyes. Results good. Vision one year after operation: right eye, 5/10: left, light perception. Pitting on pressure marked over both sites of operation one year later. Tension equals right 20 mm., left 25 mm.

Case 6.—C. T., female, aged 72. Has had cataract in left eye for 15 years without any seeming cause for it. In the last two years has had much congestion of this eye with recurring attacks of pain. The cornea was a trifle hazy, the anterior chamber practically abolished, the pupil 5 mm. irregularly round and mobile. No light perception in the eye. Tension equals 40 mm. Right eye normal in all respects. The left eye in this case presents the type in which it would be practically impossible to get a keratome, or even the narrowest Graefe knife, into the anterior chamber. Trephining was easily done, with the happiest result. One week later, the tension was 18 mm., and the patient left for home, 200 miles away.

Case 7.—J. G., aged 50, chronic simple glaucoma in both eyes. Vision was right 5/25, left 5/30. The media were clear, and the ophthalmoscope showed deep pathologic cupping on both sides. The tension was *plus* 2 (no tonometer at hand). Bilateral trephining was uneventful, and produced vision of 5/15 in both eyes one month later.

Case 8.—F. D., aged 40, female. Chronic non-inflammatory glaucoma. Had been treated for years with miotics, and her vision had been held by them for at least ten years. Within the past two years it had gradually fallen, until at the time of this observation it was 1/60 in each eye. The picture was classica with a 5½ mm. pupil, shallow anterior chamber, and a 1 mm. to 1½ mm. cup. Tension equals 30 mm. on both sides. Bilateral sclerostomy was done without much benefit, tension falling to normal, but at the end of the month the vision remained 1/60 in each eye.

Case 9.—T.W., aged 65, male. Chronic non-inflammatory glaucoma. Vision : right, 1/60 ; left, light perception in lower temporal field. Like the preceding case, the features of the case were classical. Tension was, right 24 mm., left 30 mm. Bilateral trephining was done without incident. Vision one month later : right, 3/60 ; left, light perception. This was a hopeless-looking case, and yet his vision was increased three-fold after one month by the operation.

Case 10.—E. S., aged 45, male. Right eye probably blind with chronic simple glaucoma for some years. Left eye been failing for two years. Patient in average good health. Vision was right 1/2 mm., left 5/25. Typical picture of chronic simple glaucoma in both eye grounds. Tension right 26 mm., left 24 mm. Double trephining with iridectomy. Final result : Vision right 1/2 (equals no change). Left 5/10. Final tension equals right 22 mm , left 20 mm.

Case 11.—C. P., aged 60, female, Italian. Left eye had been failing in vision for five years. Right eye only a month or so. Some pain in left eye, but no congestive signs of any kind. General health, fair. Vision right 20/40 ; left no light perception. Tension right *plus* 1, left *plus* 4 (no tonometer at hand). Shallow anterior chambers in both eyes. Cornea a trifle hazy in right eye, but marked excavation made out with ophthalmoscope. Left eye secondary cataract. June 2nd, 1912, double trephining without iridectomy. The conjunctival tissues in this case were thick and much infiltrated. A large flap was made in each eye. During the night the conjunctival flap in the left eye was swept downward by the upper lid, probably because the patient was restless and uneasy. She did not speak a word of English. Under general anæsthesia, the flap was slipped back into position and retained there with three stiches. The final result was very good. Three months later, the vision in the right eye was 5/5 and the left eye had remained from the time of operation perfectly quiet. It is our feeling that in heavy infiltrated conjunctival flaps, it would be wise to use a stitch to keep the flap in position.

(*To be concluded.*)

DECOMPRESSION IN GLAUCOMA.

BY

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Introduction.

IN a clinical memorandum* is recorded a case of absolute glaucoma I operated on tentatively, carrying out for the first time an idea I had long contemplated. The striking result has persisted without relapse to this day.

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* THE OPHTHALMOSCOPE, May 1912, p. 263.

The idea first took root in Zürich about 1898, where I learned the value of repeated sclerotomy. Bearing this significant fact in mind during the years of observation that followed, I have come to believe: that success in operative treatment of chronic glaucoma is due to springing of multiple leaks in the sclera, in the course of repeated operations, which sooner or later suffice to compensate or to replace the drainage through the canal of Schlemm; or to the immediate formation of sufficient leakage, where one single operation succeeds; that the drainage of fluid takes place directly from the source of the aqueous humor into subconjunctival spaces, along lines of least resistance, there being no impermeable tissue to prevent this, once the sclera is pervious[*]; that to reduce hypertension it could then not be essential to open the anterior chamber or touch the uvea; that, if this proved true, iridectomy, cyclodialysis, etc., are not only superfluous, but to be shunned; that, whatever the operative measure adopted, the true cause of success can always be attributed to the sclera; therefore sclerectomy alone should suffice; that if other steps are added and good results obtained, these are not owing to, but in spite of, those steps; that hypotonies are not due to trephining, but to irido-cyclitis, because the uvea has been wounded in its highly inflammable condition. To go one step farther, it is precisely because of the frequent impression I gain, when observing the great number of operative failures, namely, that the good effect the scleral part of the operation might have produced, has been directly vitiated by the implication of, and reaction from, inflamed, wounded, lacerated, incarcerated, or herniated uveal tissue, that I gradually evolved an operative plan, by which the uvea might remain untouched, and yet the tension be reduced.

Thus, briefly, runs the trend of thought which led me to seek a procedure, which would yield an outflow sufficiently ample to equal the total output of Schlemm's canal, (two holes of 1·5 mm. at least), into a sufficiently ample drainage area, (large conjunctival flap), from which the surplus aqueous humor can be flushed away by the circulation (conjunctival), because the original drainage, (Schlemm's canal) is irretrievably lost (blocked angle). The following tentative experiment occurred to me, and I am indebted to Mr. Edgar B. Burchell, Curator to the New York Eye and Ear Infirmary, for his valuable counsel and assistance in carrying it out.

We chose a large rabbit and recorded the tension of each eye. We made a conjunctival incision in one eye, localized the anterior scleral ring,[†] trephined the sclera behind it, thus leaving no communication between anterior chamber and trephine hole, injected a fixed quantity of fluorescein into the anterior chamber, sealing the corneal puncture; in the other eye we made the same conjunctival incision, omitted trephining, injected and sealed the same amount of fluorescein. On the non-trephined side there was no conjunctival reaction, no drop in tension, and all traces of fluorescein disappeared within one hour. On the trephined side, copious suffusion of the conjunctiva appeared rapidly, tension dropped considerably, while traces of fluorescein were present in the anterior chamber as long as six hours later. But the fluid continued all the while coming through the trephine hole and suffusing the conjunctiva without ever a trace of staining with fluorescein. Whatever this fluid may have been, the suggestion lies near that it was aqueous humor, or such fluid as exudes towards the formation of aqueous humor, filtering from its source through the permeable tissues of the ciliary body by the most direct route of least resistance, this being now the trephine hole, which latter usurps the function of the canal of Schlemm, so it seems, or why else should the fluid in the anterior chamber remain stagnant? The fluid exuding from the trephine hole, not being stained with fluorescein, can for this reason alone not have passed through the anterior chamber. It must therefore needs come from somewhere else. And why not from its direct source of origin in the ciliary body, which lies in such close proximity?

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[*] The vitreous membrane lines the inner surface of the ciliary processes, and although it separates their epithelium from the ciliary body, it does not appear to interfere with the passage of fluids through the latter, wherever may be their source.

[†] The transilluminator, placed over the apex of the cornea, also oblique illumination applied over the ciliary region on the side opposite the seat of trephining, show plainly a bright ring of light around the cornea, which is the illuminated anterior chamber in its extreme periphery. The clean cut outer edge of this ring indicates the situation of the anterior scleral ring. To avoid the anterior chamber, the trephine hole must not encroach upon this ring, but should just stop short of it. It is well to localize this spot in each individual case, and not to go by millimetres too much, as anatomical relations vary. Indeed, it is as well, perhaps, to introduce both my hooks (*vide infra*) in their proper places, under guidance of such illumination, before using the trephine at all.

In formulating the above I stray as far from the beaten track as does the *technique* of my operation. But the result, with its strong promise of permanency, decides me to publish it, although perhaps somewhat prematurely. I regret not being in a position to furnish more cases to the point, yet hope the method may be found worthy of a fair trial. In urging a trial, I lay stress on exact attention to detail, each step being minutely calculated, and all superfluous manipulation, I think, eliminated. For instance, I regard the second opening, as well as the sutures, as being most essential.

In describing my method, which seems so strikingly simple in plan and execution, I skip the long stages by which I brought it to its present form. Henceforth it must stand or fall on its true value. All painstaking work deserves that, even although it be another fallacy in search of truth.

The operation.

The seat of predilection is above. A large flap is marked by a circular incision, which takes in the whole thickness of conjunctiva and sub-conjunctival tissue, passes as near as possible to the insertion of the rectus muscle, without opening Tenon's capsule, is concentric with the limbus, and ends at its nearest tangent. Fig. 1A.

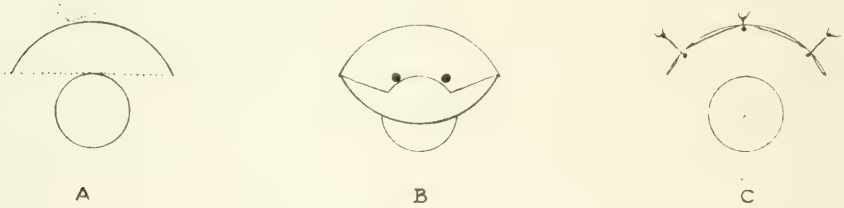

Fig 1 Natural Size

With closed scissors, or a small-sized Bowman's probe, the flap is undermined as far as this is easy, *i.e.*, to its firm attachment at the limbus, of which 1 cm is exposed, the sclera being thus laid bare without a snip or cut, but by gentle separation of the subconjunctival tissue. The flap is pulled down and two symmetrical discs of sclera, about 6 mm. apart, are removed without injury to any other tissue, so that two clean-cut holes of 1·5 mm. in diameter result, separated from the corneal margin by a glint of sclera. They must not encroach upon corneal tissue anywhere in their passage through the sclera. No buttonholing of conjunctiva or iris must occur. On the other hand, on no account is more than a trace of sclera to show on the corneal side of the holes, owing to danger of subsequent prolapse of ciliary body, which danger increases as the distance from the limbus, and terminates in enucleation!* No aqueous humor will escape, no prolapse of iris threaten, and on no condition should the hole be probed, or any attempt be made to force or to find a passage into anterior chamber or supra-choroidal space. Fig. 1B shows the exact positions the holes should take in relation to the extreme corneal margin.

The two lateral sutures (Fig. 1C) are introduced first; near the edge of the flap, and brought out far from the edge on the other side, and are placed at such points, that, when tied, they will draw the flap away from the holes. The lines of force along which they draw are most favourable, when they form a right angle at the centre of the cornea. This will prevent the holes getting entangled in the scar, will yield a broad surface for drainage, and will minimise the chances of future infection. Suture the centre of the flap up as well, using black silk and not too fine.

Apply a light bandage. After twenty-four hours, the tumid and red conjunctiva may be bathed three times a day with fennel water containing 2 per cent. sodium biborate and 1·4 per cent. sodium chloride until it is white. On the fifth day, sutures are removed and dressings left off. Possibly the marked suffusion is responsible for the somewhat tenacious conjunctival reaction, acting for some time as a foreign substance.

The effect on the tension was stated in my previous article. It dropped promptly, and has never returned or varied, the frequent tonometric readings are from 20 mm. to 15 mm. Hg. No miotic has been used. The patient has attended regularly, her eye never troubles her any more. It looks normal, with a perfect pupil of average size, which now reacts briskly to consensual light stimulus. The patient has stated that she can at times perceive light, but I have never been able to discover it. Quite recently, she suffered a severe mental shock and wept frantically for days, but her eye derived no ill. Two years have elapsed from the day of operation. The patient's condition remains unchanged.

Anatomical relations.

Fig. 2, A and B, are the averages of extensive and very careful microscopic measurements in normal and glaucomatous eyes. They should be fairly

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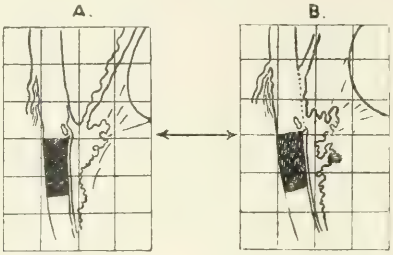
*In making an opening like this, one must bear in mind the slant at which the cornea is set into the sclera. This shows as a narrow, pearl-grey, pericorneal zone, as the dark cornea tones gradually to the white sclera. This transitional zone must not be included in the trephine, which is to cut through only white tissue. Such an opening in the sclera proper, if correctly made, cannot communicate with the anterior chamber, even in normal eyes, far less in glaucomatous ones. (*See Figs.* 2 *4 and B.*) Only force could produce such a communication, for the situation is behind the anterior scleral ring, to which the ciliary muscle is attached. When the first hole is made, the ciliary body rotates around this fulcrum, and uvea presents in the opening. This was noticeable in my first case by the pupil being drawn slightly towards the opening, and a black hernia presenting in the latter. This hernia, of course, not iris, but ciliary muscle, promptly readjusted itself as soon as I made the second opening, in which no such prolapse appeared. One must not be tempted to anticipate a prolapse of iris, or to take this hernia for one, because it drags the iris after it, as it is obviously impossible, there being no opening for iris to prolapse through. That one must, however, remain as close to the limbus as possible, I learned soon after, when, in order to convince the most sceptical in me, that filtration need not of necessity, take place from the anterior chamber, in order to reduce tension. I left, in another case, 3 mm of sclera on the corneal side. The immediate result was just as good, and remained so for a few days, when the ciliary body began to prolapse, and tension returned. This case shows plainly the danger of straying from the limbus, but also showed the safety of my trephine, for in this eye, enucleated a couple of months later, no adhesions had formed around the holes. Fluid injected into the supra-choroidal space at the posterior pole, squirted freely through them. The tension had returned through the mechanical plugging of strangulated ciliary body, and not through blocking with exudates.

trustworthy. The black portion of sclera is removed in my operation. The arrow points to the extreme corneo-scleral margin, the spot where the conjunctiva becomes firmly attached, where all corneal tissue ceases, where the sclera first looks quite white, where the anterior scleral ring lies. The holes should never reach in front of this arrow; in my sketches they are placed as far behind it, as I consider it safe to venture.



5 diam 5 diam

Fig. 2

Explanation.

I have named my operation "Decompression," as being non-committal. It must be difficult to bring forward incontestable proof of what really takes place. If a double opening maintains its reputation, it is only through continuous success that it can do so. It matters little, then, to know whether it be a question of area, of atmospheric pressure, of drainage at different points, of increased intraocular space, of analogy with decompression of the skull, or merely a question of two chances to one. But I think the view I gather from the experiment with the rabbit, that it gives the aqueous a direct channel of escape, is worth following up by those who have the opportunities and the skill I lack in experimental research.

My scleral trephine.

It is immaterial what instruments are used. It needs a trephine capable of drilling a clean-cut hole, with no tags, no effort, no compression of the eyeball, and incapable of damaging deeper structures. I invented my scleral trephine to suit my own purpose, some five or six years ago, and modified it until in its present form it does so fully. I know of no other instrument that can fulfil the above conditions, which are of the greatest importance.*

Fig. 3, A-G, are as exactly drawn in natural size, as I am able; these are the correct dimensions:

(A) A steel tube, full ½ mm. thick, with inner calibre 1·5 mm. or 1/16 inch, 23 mm. long, with a screw-thread of 3 mm. at one end, a bevelled, hollow-ground, true cutting end, 1 mm. long, with the temper of cutting tools.

(B) A perforated cylindrical nut, 10 mm. long, 5 mm. wide, which can be screwed either way on to the tube (A), giving a trephine of 23 or 30 mm. in length. I prefer it short.

(C) A collar of spring temper, 4·5 mm. long by 4 mm. wide, slotted in one place, notched in two, may be slipped over the trephine, gripping it forcibly, and can be moved to any position along the tube (A), where it will stay firmly, without slipping.

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* I drew attention to it in conjunction with a simple suggestion for securing the disc with a suture passed through the trephine (*Ophth. Record*, Sept., 1910.) This is difficult with a smaller calibre. Mr. Arthur Hollister, of F. A. Hardy & Co., 29 E 22nd Street, has charge of making my trephines in this city, and those bearing my initials are correct, and, as far as I can judge, well made. The instrument is not patented. I give its exact description, having spent so much time and thought on it, and tried every imaginable device, that I do not shrink from saying it would probably be a waste of time to seek a simpler tool that did better work. Any good instrument maker can make it.

(D) The hook : Its rod must fit the trephine easily, but with no "wobble." The length is optional, a 6 cm. rod suits me : it must not be any shorter. The hook itself must just clear the lumen, be provided with a shoulder or fulcrum, and an exceedingly sharp point, bent somewhat back. It must be highly polished, conical, sufficiently heavy, and so carefully tempered as to resist a bending stress greatly in excess of the one it will ever be put to. It must never break in the sclera. The surgeon must feel that he can trust to his hook. A poorly made hook is a sham and a nuisance ; a good one a truly wonderful help. An instrument maker who will turn out a poor and breakable hook, commits a grievous offence, if he does so through carelessness ; if incapable to turn out a good and reliable one, he should seek another job. Fig. 3i, is my ideal of a hook, in shape and proportions, enlarged 10 linear diameters. I do not mean to imply that the making of such a hook is an easy job. It is a very difficult one. I have made a number myself. Only a very skilled mechanic and one well versed in the tempering of steel, should be entrusted with this job. When sharp, smooth, well shaped, and correctly used, it glides into the scleral fibres with no effort ; when otherwise, it is an abomination.

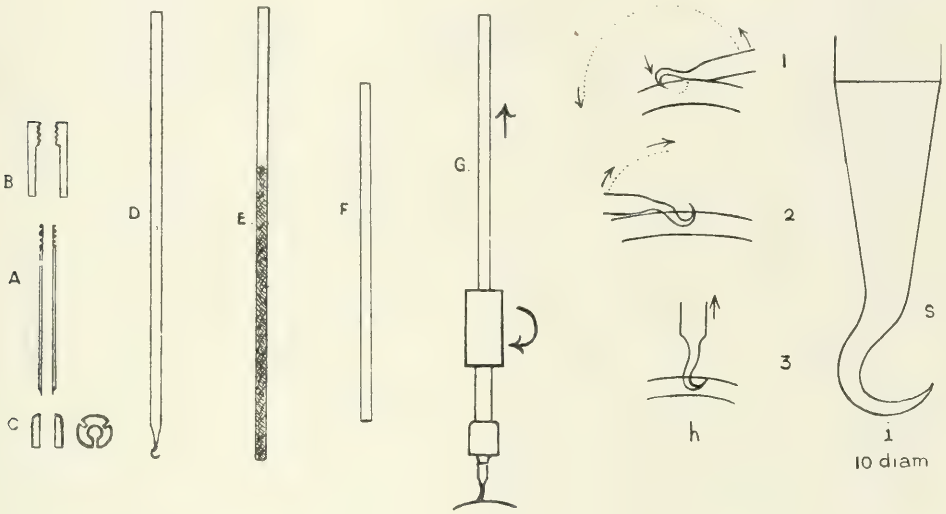

Fig. 3. A-G Natural Size

(E and F) Always before cutting sclera, I use a short rod (F) of chilled steel, which fits the trephine so tightly, that piston movements keep the edge keen. When it is less keen, I use first a brass rod (E) charged with fine corundum or carborundum, finishing with the steel rod (F). For these rods to be effective, it is imperative that the inner walls of the tube (A) be strictly parallel, clear to their sharp edge.

(G) Is supposed to show the trephine in action.

Any imperfection in an instrument like this, any corrosion on the close fitting or sharp parts, will render it useless for doing the delicate work it is intended for, and very capable of performing. I therefore keep mine lubricated with fine and not sticky machine oil. Watchmaker's oil, prepared as follows, is still better.—Fill a tumbler quarter full of strips of sheet lead. Fill it with the best olive oil of Nice. Cover and expose to the sun for one month. Transfer the top half to a clean bottle with a pipette, throwing the rest away. Only the perfectly clear layer of oil is non-sticky and non-corrosive, and fit for use on delicate instruments. I disapprove of boiling, but remove the oil with soda and pipe cleaners, pass through carbolic, alcohol, to sterile simple solutions.

How to use my trephine.

Screw the nut (B) on to the tube (A), either way you prefer. Push the collar (C) over the tube (A) with the square end facing the eye (one end being bevelled), and flush with the beginning of the bevel at the cutting end, which will thus protrude 1 mm. Do this by sliding it into place with the thumb or index nail, and not by rotation.

Insert the hook as shown in fig. 3, h, 1, 2, 3, by holding it at a tangent to the limbus, driving the sharp point well into the sclera, until the shoulder S checks it. The length of the point is so calculated as to make a perforation of the sclera impossible, if the hook is inserted in this manner. Holding the point well into the sclera, use the shoulder S as a fulcrum, rotating the handle through 180 degrees, till the point of the hook reappears through the sclera its point of entrance and of exit being equidistant, scant 1 mm., from the zone described above, and indicated by the arrow in the figs. 2 (A and B).* As soon as the point is fairly out, rotate the handle back through 90 degrees, into the perpendicular position, and you are ready for trephining, with a good piece of sclera firmly hooked. I now grasp the handle of the hook near the globe, pass the trephine over it, then, changing hands, I pull lightly on the end of the handle with one hand (my left), and rotate the trephine with the other (my right), using thumb and forefinger for both movements. It is here that the exact perpendicular must be strictly maintained, by keeping watch over the cutting edge of the trephine, which must bite into the sclera all around at the same instant, lest a long flap be cut instead of a perfect disc. One does well to practice on pigs' eyes. After the necessary skill has been acquired, one may even dispense with the slotted collar, fig. 3C. As soon as the last fibre of sclera is severed, I stop rotating the trephine, and the disc of sclera comes away on the end of the hook, and is pulled through the trephine, like a cork out of a bottle. The second hole is drilled in precisely the same way, the force required to insert the hook being of no such degree as might produce a bad effect on the first hole. Those who have a double set of trephines, and fear to exert too much pressure on the globe, when introducing the hook the second time, may find it well to insert both hooks before trephining, having one held ready by an assistant.

In concluding, I confess that the temptation to try this operation in acute glaucoma is very great. All the greater must be our effort to resist it. It might succeed, for if fluids escaped there, as here, it would not be very surprising, should a similar drop in tension result. But any operation that could presume to replace, or even to equal, the unimpeachably correct von Graefe operation, must indeed first submit to the very severest tests, and it is a very different matter to seek a sure method, where one is needed, by work on blind and painful eyes, or to merely seek an easier one where a sure one already exists. It behoves us all to become and remain proficient in the correct performance of von Graefe's operation.

My clinical studies on glaucoma during the last six years I have carried out largely in the clinic of Dr. Wilbur B. Marple, to whom I here repeat my thanks. But, whether this article prove to be right or wrong, truth or fallacy, I feel bound to hold myself alone responsible for it.

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New York City.

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* The point of the hook will have thus described a circle through so much thickness of sclera as to insure a firm hold. This movement must be performed boldly and without fear, not merely picking at the surface fibres, whereby they would tear. I am aware that the sclera is much thinner, in specimens, than 1 mm. at this point. However, with the turgescence of living tissue, this is a safe position for the collar, and the bevel affords a quick and easy guide where to place it. I have deliberately tried, with the instrument set thus, to wound the ciliary body in pigs' eyes, whose structure, I am told, is nearest to the human eye, and have failed.

EYE INJURIES FROM EYEGLASSES.

BY

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Introduction.

CONSIDERING the great number of individuals who wear eyeglasses, it seems striking that injuries from broken eyeglasses are very rare. This is proved by the circumstances that neither Wagenmann[5] nor Praun[3] in their books on injuries of the eye devote to this kind of accident a special consideration or special statistics. In the literature I can find only two papers dealing with this subject. Bourgeois[1] does not give any statistical data as to the frequency of injuries from broken eyeglasses (according to the yearly reports of Michel-Nagel and to the abstract given by the second author). Vogt[4] states that such injuries from broken eyeglasses are to be considered as rarities.

Such data do not, however, suffice to answer the question as to the proportion of these injuries to the total number of individuals wearing eyeglasses. Just this question is of practical interest, as it occurs to every oculist to be asked by patients whom he orders to wear glasses (more frequently still by parents and guardians of children for whom glasses are prescribed) as to the danger the wearing of glasses involves. Unfortunately, we do not possess any accurate knowledge as to the absolute number of individuals wearing glasses, nor as to their proportion to the total number of the population. This proportion surely differs according to different countries and according to the population of town and country districts. I cannot even attempt to estimate the number of individuals wearing eyeglasses in Vienna, which must primarily be considered here. We can get an approximate idea about the frequency of eye injuries from eyeglasses, however, if we consider the number of these injuries in comparison to the entire number of our patients.

Since the beginning of my ophthalmological training, I have been able to survey a number of a little above 150,000 patients (1901 and 1902 in the clinic of Professor Fuchs; from 1903 until now in the clinic of Professor Schnabel and his successor, Professor Dimmer. To this number must be added private patients). Amongst this number of 150,000 patients there occurred five cases of lesions from broken eyeglasses, *i.e.*, one in 30,000 cases. These statistic conclusions are perhaps not quite stringent; it occurs to me that the first case of such an injury came into observation after I had seen 85,000 patients, and three cases have occurred within the last year. In a series of only five cases, accident can play a great part.

Professor Fuchs and Professor Dimmer both confirmed my view, namely, that such injuries are exceedingly rare.

Cases.

The following histories will give us some explanation as to the mechanism of the injuries:—

Case I.—M. S., aged 28 years, chemist, was reading during a railway journey; he wore an eyeglass, and was turned sideways to the wall of the car. The train stopped suddenly in a station; the shock hurled him strongly against the wall, so that the eyeglass broke. A splinter of the glass penetrated into the patient's left eye. He extracted it himself, so that the railway physician only applied a bandage, and sent the patient to the clinic. The glass splinter apparently possessed the length of the short diameter of the eyeglass. The next day examination showed the following condition: R.E. normal;

V.=1·0 (—0·75 D. sph.); L.E. considerable suffusion and œdema of the bulbar conjunctiva. The iris is slightly tremulous. In the vitreous blood-clots are visible. In the inferior nasal part of the extreme periphery a white area is to be seen in the fundus; it is sharply outlined towards the periphery by a red margin; the central border is a little irregular, and of a reddish-brown colour. From this area a white stripe runs in an equatorial direction. On account of the extreme peripheral situation of the changes, it is not possible to make sure whether there is any parallactic movement. In the surroundings of this place there are several light areas which give the impression of folds. On the nasal inferior side, corresponding to the ophthalmoscopic changes, there is a small perforation in the coats of the eye; it lies a few millimetres above the transition of the conjunctiva of the globe into the fornix. This place shows the strongest suffusion. V.=1/30. The *X*-ray examination (Dr. Holzknecht) showed no foreign body in the orbit.

Under general anæsthesia, the place of the injury was exactly investigated. For this purpose the conjunctiva was incised. The sclerotic shows a sharp wound, 6 mm. long, in the region of the equator, running in an equatorial direction; the choroid and retina were also perforated. In the vicinity of the wound no foreign body was to be found with the probe. The conjunctival wound was closed by two sutures. The wound healed without reaction, and the sutures were removed six days later. When the patient was dismissed, four days afterwards, iridodonesis was no longer noticeable. Cornea, aqueous humour, and lens were clear. Out of the interior of the eye red light is reflected only in the upper parts. In the inferior parts of the vitreous, dark cloud-like formations are visible. V.=fingers at 30 cm. When Professor Schnabel saw the patient, about six weeks later, there was only uncertain light perception remaining. In the vitreous there was no more blood; the retina was detached and torn at the site of the injury.

Case II.—F. F., teacher, aged 32 years, was injured on the 28th June, 1909, by the explosion of an acetylene lamp, the container of which struck the left half of the face and shattered the spectacles the patient was wearing. The glasses were framed, + 0·75 D. sph. Splinters of the glass penetrated into the lids and eye of the left side and caused profuse hæmorrhage. A physician stitched the wounds and put on a dressing. When I saw the patient the next day he showed: R.E. normal. L.E. In the upper lid a curved wound about 1 cm. long closed by several sutures. In the margin of the lid a few shallow incisions. Conjunctival and ciliary hyperæmia of the globe; the inferior half of the bulbar conjunctiva is suffused and shows a wound which is closed by a silk suture. In the inferior nasal quadrant of the cornea is a linear wound 4 mm. in length which continues about 6 mm. into the sclerotic. In this wound, which is partly closed by the sutured conjunctiva, some uveal tissue and vitreous are jammed. Through the transparent cornea and deep anterior chamber the iris is seen adherent to the wound on the inferior nasal side. No lens reflex to be obtained; no red reflex from the fundus. The eye is very soft and tender to pressure. Good light perception and localisation. It was not possible to ascertain whether a foreign body was present in the globe.

On the 30th June the prolapsed parts of the uveal tissue were excised and the wound sutured (general anæsthesia). The wound healed slowly without inflammatory reaction. On the 28th August, V. was 0·2 with + 8·0 D. sph. + 9·0 D. cyl. 20°. Four days later, pain arose as the first sign of an iridocyclitis, which led to occlusion of pupil and coloboma, and to consecutive shrinking of the globe. The eye had to be enucleated on the 5th November on account of the danger of sympathetic ophthalmia. The implantation of fat performed in combination with the enucleation gave a very good result.

Case III.—J. B., aged 20 years, was injured during the night of the 1st December, 1912. A metal wardrobe-number struck the patient's eyeglass, broke it, and splinters of the glass injured the eye. The patient at once came to the clinic.

2nd December. R.E. normal. L.E., a cut runs across the temporal two-thirds of the cornea. The iris is jammed in the wound below to the length of 5 mm.; it is, however, not prolapsed. The anterior chamber is absent. The part of the iris attached to the wound is discoloured, grey, and its structure is blurred. At the upper circumference of the pupil a posterior synechia is visible. From the opaque lens a membrane runs up to the corneal wound. Rest in bed, atropin, bandage.

9th December. The irritation of the eye is insignificant. The posterior synechia is torn, so that the pupil is round above.

13th December. The part of the iris attached to the cornea is atrophic: no pain. Large objects are seen. Transillumination with the ophthalmoscope gives a red reflex in some directions. R.E.V. = 1·0 with—3·25 D. sph.

14th January, 1913. The patient has again to be admitted on account of considerable conjunctival and ciliary hyperæmia of the injured eye. After two days of rest in bed, atropin, and warm applications, the eye is quiet.

18th January. Behind the atrophic parts of the iris some glittering object is seen. Transillumination with the Sachs lamp shows distinctly a large splinter of glass which is jammed behind the iris in a transversal direction. It is wedged-shaped, the tip of the wedge being turned to the nasal side.

20th January. Operation. Flap section with the Graefe knife in the limbus below. An attempt to grasp the foreign body fails. The section is lengthened with scissors, the iris severed at its root with the Graefe knife and the glass extracted with the forceps. Catgut suture of the conjunctival flap. Recovery without further reaction.

13th March, 1913. V.=0.3 with +10·0 D. sph.

21st December, 1913. The eye is pale, shows no signs of irritation. V=0·2 with +9·0 D. sph. The field is slightly contracted on the nasal side. Central colour scotoma. The size of the extracted glass splinter is 9·2 by 4·3 by 1·3 mm.; its weight (Dr. Jansch of the Pathological-Chemical Institute), 0·1326 grm.

Case IV.—J. C., a boy aged seven years, had been ordered to wear glasses a few days previously (+ 4·0 D. sph.). He got framed spectacles. On the second day he was wearing them, on the 21st October, 1913, a ball hit the left glass and shattered it.

R.E. normal. V.=0·5 with + 4·0 D. sph. L.E. The lids are normal. In the centre of the cornea there is a wound 3 mm. long, to which a thin tag of the iris is adherent. In the anterior chamber lies a particle of glass, the tip of which is directed towards the iris and seems to perforate it.

22nd October. Under general anæsthesia, the glass splinter was extracted and a piece of the iris was excised. 5th November. 2·0 D. of astigmatism; V.=0·1. On the 6th November, two small blebs were noticed in the inferior nasal quadrant of the cornea; the next day a third one was noticed. Exact examination showed that these blebs were tiny particles of glass; they were removed on the 11th November, under local anæsthesia. The recovery was a favourable one, and the child was dismissed on the 15th November with V.=0·1 in the injured eye.

Case V.—E. S., student, aged 21 years, was injured on the 30th December, 1913, whilst he was looking on at a pig being slaughtered at his parents' house. The butcher hacked off the hoofs of the pig, when one of them flew against the patient's right eye, shattered the unframed eyeglass he was wearing

(−2·25 D. sph.) and caused an injury to the eye. The patient appeared at the clinic on the 5th January, 1914.

L.E. normal; V. = 1·0 with—2·25 D. sph. R.E. considerable photophobia, conjunctival and ciliary hyperæmia of the globe. In the temporal half of the cornea lie several linear scars, and between them a small particle of glass; in the vicinity lie several glittering dots, perhaps also particles of glass. In the superior part, the anterior chamber is deeper than below; the pupil below is not quite round. In it the opaque lens is visible. The pupillary margin is irregular from posterior synechiæ, especially on the nasal side. Here the iris is somewhat pushed forward by sodden lens masses which partly protude through the pupil into the anterior chamber. Good light perception and localisation. 10th January.—A part of the sodden lens substance is evacuated by a corneal puncture and a piece of the iris is excised. The further recovery was a smooth one. The patient is still under observation at the clinic.

Comments.

The five cases of Vogt and the ones now reported are sufficient in number to admit of some general conclusions.

The forces which cause such accidents are mostly severe, and generally of a kind to which one is but exceptionally exposed. It must, however, be acknowledged that only in one case the injuring force (explosion of an acetylene lamp) would have severely damaged the eye even if the patient had not been wearing glasses. Praun's[3] statement that in cases of injury from eyeglasses the cause is almost always explosion is, perhaps, correct in relation to protective glasses in industrial labour. In the reported series of cases it occurs but once as the ætiological factor. In most instances large objects flew against the glasses with violence sufficient to shatter them.

I would like to mention especially that only once a glass injured its wearer when he fell from a bicycle (Vogt, Case I).

It must still be considered whether the eyeglasses do not sometimes protect the eyes, in accidents caused by large objects, by diminishing the force of the blow or by changing its original direction. This possibility must not be neglected, as all objects mentioned in the histories were well able to cause severe lesions of the eyes, especially considering the violence with which they struck the patient. In all ten cases the glasses were not industrial protective goggles, the value of which needs not to be mentioned; they were all glasses worn for the correction of refractive errors. Even protective goggles can be shattered, as is proved by the cases of Bourgeois; but, even then, the eye need not necessarily be damaged. Hirschberg[2] mentions a case in which a chip of iron, weighing 6020 milligr., had shattered the goggles but left the eye intact.

The question as to whether framed or unframed glasses, whether spectacles or eyeglasses (*pince-nez*), are more dangerous, remains to be discussed. Of the ten patients only three had worn eyeglasses, the other seven spectacles; unframed glasses are mentioned twice, six times the glasses were framed, and in two cases this detail is not given. It seems that spectacles are, in general, more dangerous than eyeglasses, most probably because the latter drop off much more easily than spectacles. With regard to the present material, it is difficult to decide the question whether framed or unframed glasses are more dangerous. The people who are more liable to be exposed to traumatisms chiefly wear framed glasses, which circumstance sufficiently explains the greater frequency of breakages of framed glasses. Out of my own experience, I can relate the following incident.—By a joke a soft sofa cushion was thrown into my face, striking the right eye; the glass of my unframed eyeglass broke off close to the clasp. A framed glass would surely not have been broken by the insignificant force, it would probably have been pressed out of the frame, as occurs frequently in framed glasses worn for a long time. I believe that under the usual conditions of life framed eyeglasses are the safest way of wearing correcting glasses. For sporting purposes, where the loss of the glasses is not only disagreeable but sometimes even dangerous, spectacles fitted in horn frames and with wire ear-hooks are probably the best. I have repeatedly seen in snow-shoeing that when somebody fell either the glasses dropped, or if the violence of the fall was greater, the horn frame broke and the glass dropped out without injuring the eye. It is surely to be recommended to every myope of considerable degree to have a pair of reserve glasses at hand. The loss of glasses for such individuals may be the source of serious danger.

From this report one sees, as in other kinds of injuries, that females are much less exposed to injuries than males; in fact, among the reported cases there is no female at all. In this special kind of injury there is another factor over and above the usual ones. Surely the circumstance is of influence, that in Germany and Austria females wear glasses much less than the males. The cosmetic moment is very important here, whereas in America this does not seem to be the case in the same way. In the out-patient department, and still more in the private office, it is frequently impossible to prevail upon ladies to wear the prescribed glasses, the influence of vanity being too great. I have never found any resistance among American ladies, and American colleagues confirm this statement.

In one case only the injury affected a child, and once it affected a man of sixty All other cases were young men, a proof that they are more generally exposed to this especial kind of injury.

The history of injuries from eyeglasses does not differ from the course of injuries of other origin. Two eyes became totally blind, and one of them had to be enucleated through risk of sympathetic ophthalmia. No case showed acute suppuration. Intra-ocular foreign bodies were present in two cases.

Considering the reported cases, one must come to the conclusion that the wearing of glasses involves a certain degree of danger, which is very small (at most, one case in 30,000 patients) and cannot be considered as a sufficient reason against the wearing of glasses in general, especially as glasses much more frequently prevent injuries than cause them, even when they are not worn for the purpose of protection from mechanical injuries.

To Professors Fuchs and Dimmer I present my thanks for the information kindly given, and for the reports of the cases at their clinics.

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CLINICAL MEMORANDA.

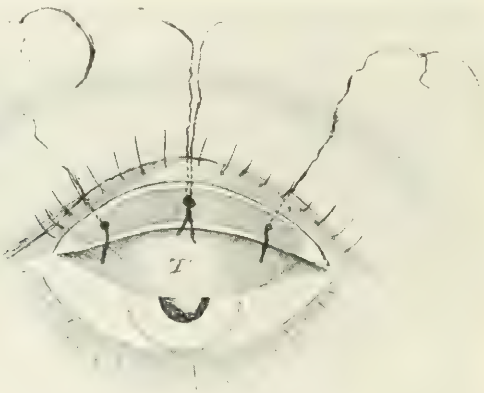
AN OPERATION FOR TRICHIASIS.

BY

W. ODILLO MAHER, M.D.

HONORARY CONSULTING OPHTHALMIC SURGEON TO THE SYDNEY HOSPITAL, AND HONORARY OPHTHALMIC SURGEON TO ST. VINCENT'S HOSPITAL, SYDNEY, AUSTRALIA.

THIS operation consists in thoroughly dividing the tarsal " cartilage " from the under surface of the lid, from end to end, at about three millimetres from its free edge—as in Burow's operation—and fixing with sutures in the division in the "cartilage" a piece of mucous membrane from the lip, the length of the tarsal cartilage, and about three or three-and-a-half millimetres wide.



Everted lid showing mucous flap in position and sutures passed. T tarsal plate.

Description of Operation.

The operation is thus performed.—Standing behind the patient, the lid is everted, and a puncture made with a Beer's knife through the tarsal " cartilage," at the outer canthus if operating on the right lid, and at the inner canthus if operating on the left. One blade of a small, straight, blunt-pointed scissors is now passed through this puncture, and the " cartilage " and all the structures of the lid are divided to the skin from end to end parallel to, and about two-and-a-half millimetres from, its ciliary margin. The lower lip is then grasped with a Snellen's entropion clamp, to prevent hæmorrhage, and a flap of mucous membrane, the length of the incision in the cartilage, and from two-and-a-half to three-and-a-half millimetres broad, is marked out by two parallel cuts with a Beer's knife, and removed by a few snips of a scissors. The mucous membrane flap is then laid on the tip of the forefinger of the left hand, and all submucous tissue snipped off with scissors. Three silk sutures, two single and one double, with knots about two centimetres from the ends, are used. The single sutures are passed through the ends of the flap from its mucous surface, and then through the ends of the cut in the

" cartilage," coming out on the cutaneous surface of the lid near the canthi, and about three millimetres from its free edge. The double suture is then passed through the middle of the flap from its mucous surface, and through the middle of the cut in the " cartilage," coming out on the cutaneous surface of the lid, midway between the canthi, and a few millimetres from the ciliary margin. By drawing on these sutures, the knots pull the flap of mucous membrane well in between the edges of the cut in the " cartilage." The sutures are then tied, each single suture to one thread of the double suture. The edges of the wound in the lip, which causes very little inconvenience, are now sutured together. The lids are dressed with an antiseptic dressing, smeared with a little vaseline, and left undisturbed for about thirty-six to forty-eight hours, when the sutures are removed. The object of having the knots a couple of centimetres from the ends of the sutures is to facilitate the removal of the sutures.

The effect of the operation can be enhanced by dividing the external canthus, and it is always advisable to do this when the incurving of the " cartilage " is well marked.

Remarks.

This operation was first performed by me in April, 1896, and during the past fifteen years I have performed it on some hundreds of cases with most satisfactory results.

An account of the operation was published in the *Archives of Ophthalmology* in 1897, Vol. XXVI, page 340; and my reason for again publishing it, this time in THE OPHTHALMOSCOPE, is that I think it must have escaped the notice of ophthalmic surgeons outside Australia, for my experience, and the experience of other ophthalmic surgeons on this side of the world, is that it gives better results than any other operation for trichiasis.

A special feature about this operation is that no tissue is removed from the lid, but the soft mucous membrane added in a measure replaces tissue which has undergone absorption. It produces no disfigurement, and when the lids are closed, a soft cushion of mucous membrane comes in contact with the cornea, instead of, as in most instances, hard cicatricial tissue.

[FROM THE UNIVERSITY EYE CLINIC IN BUCHAREST, ROUMANIA.]

A METHOD OF OPERATING ON IMMATURE CATARACT WITH SHALLOW ANTERIOR CHAMBER.

BY

DR. N. MULGUND.

CALCUTTA, INDIA.

WE see a good many cases of cataract with a very shallow anterior chamber, especially when the cataract is immature. The usual plan is to send them back to wait for some time, in fact, until the anterior chamber becomes normal.

When the cataract becomes mature, the anterior chamber becomes normal. But often enough, while the cataract is mature, the anterior chamber is very shallow. The position is then a difficult one.

A mature cataract with very shallow anterior chamber recently came to the Bucharest Clinic. Something must clearly be done for cases of this kind. Whatever be done should combine safety, certainty, and facility, *i.e.*, safety for the patient and certainty for the surgeon, and with these a facility for executing the operation. The patient in question gave the history that he had lost his sight for seven years.

In thinking over cases of this kind, it occurred to me that an injection might be made into the anterior chamber in order to deepen it enough for the operation to be performed. On mentioning this to Professor Stanculeanu, the latter said that the same idea had been suggested six months ago by Miss A. Leonida, an assistant in the clinic.*

I determined to experiment on the eyes of the rabbit. On the same evening, I made an injection into the anterior chamber of the rabbit's eye with about 5 minims of normal saline, and remarked that the anterior chamber was more deep than it was before and the liquid remained in the chamber.

The next morning we arranged to perform the cataract operation with injection into the anterior chamber. Accordingly, the patient was prepared and was brought on to the table, and the injection was made with normal saline into the anterior chamber. The quantity of the liquid was not limited; enough was injected to have the anterior chamber sufficiently deep to make a correct incision.

The injection must be made exactly in the limbus with a very fine needle, as the liquid will otherwise escape with the aqueous. If the introduction of the needle be corneal, or if the needle be rough, then the opening caused by the needle does not close soon. Hence a fine needle must be used in a correct place.

After the injection had been made, a very good chamber was present, and the operation was performed without the least complication.

This being the first case, the injection with normal saline was made with considerable trepidation in subsequent ones. The procedure, however, was so simple and satisfactory that the other seventeen or more cases on which we operated afterwards went smoothly. The results were quite satisfactory.

NOVELTIES.

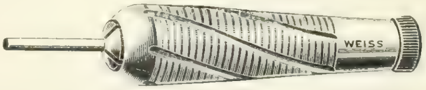
A NEW HANDLE FOR GLAUCOMA TREPHINE BLADES.

BY

R. H. Elliot, M.D., F.R.C.S.

LONDON, ENGLAND.

Messrs. Weiss, of London, have recently made a trephine handle which presents some new and, I think, advantageous features. It weighs half an



ounce, and takes tubular blades of any diameter from 1 mm. to 3 mm. It consists of three parts, *viz.*, (1) an outer sleeve or casing of aluminium, tapering toward the proximal end, fluted spirally and grooved laterally; (2) a

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*Miss Leonida's communication, describing the method of operation, was published in *La Clinique Ophtalmologique* of January, 1914, and a translation by Dr. Adolf Alt appeared in the *American Journal of Ophthalmology* of February last.—Editor.

spring holder cut in four sections from solid steel, somewhat on the principle of a lathe chuck ; and (3) a screw with a milled head. When this screw is loosened and the chuck is pushed forward, the sections of the latter open, and the trephine blade can then be inserted between them. When it is worked home, on the other hand, it draws the chuck back into its sleeve, and the blade is then gripped firmly and in the middle line. A pin and groove prevent the chuck from rotating within the sleeve. The use of this handle enables a surgeon to set his trephine blade as long or as short as he wishes to, and also to use any size of blade from the smallest to the largest. Before putting the instrument away after use, it is necessary to take the handle to pieces, to dry each part, and then to vaseline the screw and the outer surface of the chuck. If this be done the instrument will always be found in working order when needed. No pressure is required during trephining. With a sharp blade, the instrument cuts its way through by its own weight.

TRANSLATION.

THE SCLERECTOMY OF LAGRANGE AND THE TREPHINE OPERATION OF ELLIOT.*

BY

DR. JOSEPH MELLER,

VIENNA, AUSTRIA.

DR. JOSEPH MELLER, of Vienna, read a paper in September, 1913, which has recently been published in the *Klin. Monatsblätter für Augenheilkunde* (January, 1914). The paper is entitled "The Sclerectomy of Lagrange and the Trephine Operation of Elliot." This paper is a report based upon the results of 389 Lagrange operations and 178 trephine operations. Included in the paper is a report of the microscopical examination of eleven eyes enucleated (in several cases the specimens were obtained on the death of the patient from some intercurrent disease) after the Lagrange operation, and of four eyes removed or obtained after trephining. The cases were all observed carefully both before and after the operation, so that up to the present time the paper is a unique one in respect to the number of cases operated upon, and the care with which the cases have been followed subsequently.

It has seemed to the writer that a *résumé* of Dr. Meller's conclusions (with which his own observations of the two operations have led him in the main to agree) would be of interest to the readers of THE OPHTHALMOSCOPE, and he therefore contributes it here.

Meller first makes some observations of a general nature concerning Elliot's operation, and describes Elliot's present method of making the conjunctival flap (presented at the London Congress). As Elliot uses a 2 mm. trephine, he is compelled to dissect far forwards. Meller says we do not do an actual "splitting" of the cornea, nor is that to be recommended, for the rigid and impervious outer corneal layers would at once partly close our opening What we really do in order to obtain sufficient room for the trephine is to dissect or peel off the conjunctiva at the limbus up to its transition into the cornea. A point Elliot and Lagrange both emphasize is the importance of keeping as far forwards as possible, away from the ciliary body.

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* Abridged translation and epitome from *Klinische Monatsblätter für Augenheilkunde*, Januar, 1914.

One advantage of the Lagrange operation is, that we can vary the size of the piece of sclera to be excised, for we can make the scleral flap broad or narrow by turning our knife more or less obliquely backwards in completing the section. With the trephine, however, we cannot vary the size of the opening after once starting.

The great advantage of the Elliot operation is that its *technique* is so much more easy. The most difficult step in the usual iridectomy—that is, the passing of the knife through a shallow anterior chamber with wide pupil, and often with cloudy cornea in a sensitive eye, and consequently a restless patient—is unnecessary in the Elliot operation. In performing the latter, there is only a little pain when the trephine perforates, and at this moment it is not difficult to hold the trephine under such control that injuries of the deeper parts do not occur. In not a single case of Meller's 178 trephine operations was there an injury of the lens. The important point is to keep as far forwards as possible towards the cornea, in order to avoid injury of the ciliary body. Meller's specimens show that the section always penetrates close in front of the scleral spur, and in one of the cases the ciliary muscle was injured. Meller prefers a 1½ mm. trephine, with which one is less apt to get too far back. He refers to the remarkably clear manner in which Elliot has described all the complications which can occur in his operation. He follows Elliot's method of pressing somewhat more firmly on the corneal than on the scleral side, so as to cut through the former first. In excising the disc one must not leave a small strip of tissue behind, as this results in a partial closure of the trephine opening. We sometimes do not excise the iris far enough in the periphery, in which complication is to be found one of the causes of iris incarceration and prolapse.

Meller prefers not to seize the scleral disc and iris at the same time, as Elliot advises, but first carefully to excise the disc, and then to do the iridectomy.

He does not agree with Elliot's suggestion, in non-inflammatory cases, of not removing the whole thickness of the scleral disc in order to limit somewhat the freedom of filtration, for such a procedure might lead to a subsequent complete closure.

He agrees with Elliot's suggestion, to begin the use of atropin soon after the operation, on account of insidious iritis.

He next turns to a comparison of the results of the two operations, Lagrange and Elliot, and finds that the latter offers the same chances as the former for the production of an œdematous cystic filtering cicatrix, which, according to Lagrange, is the most favourable form, while the danger of an ectatic scar after the Elliot is less than half as great as after the Lagrange. Furthermore, an ectatic cicatrix is much less serious after trephining than after sclerectomy.

Meller divides his cases into two groups: "A," Those in which the sight was preserved, or if that was already lost, where the globe was preserved with normal tension; "B," All cases terminating badly.

Group A, good results ...	69 per cent., Lagrange. 72 per cent., Elliot.
Group B, bad results... ...	8·4 per cent., Lagrange. 2·4 per cent., Elliot.

That is, the chances of a good result after the Elliot are just as good as after the Lagrange, while the chances of a bad result are less than one-third what they are after the Lagrange.

Complications such as lens opacities, severe irido-cyclitis with atrophy of the globe, expulsive hæmorrhage, &c., not at all infrequent after the

Lagrange, are scarcely met with after trephining. There is a tendency after both operations for the iris to fall into and to heal in the wound, and thus to block up the opening, especially (in the Elliot) after a peripheric iridectomy, or peripheric incision of the iris. He operated in this latter manner (peripheric incision) in 8 per cent. of the trephining cases, and these cases furnished 46 per cent. of the iris prolapse.

If the Elliot operation is done with a complete or peripheric iridectomy, the danger of iris prolapse is certainly not greater than after the Lagrange.

The percentage of vitreous loss is a little greater after the Lagrange (3·4 per cent.) than after the Elliot (2·8 per cent.). But vitreous prolapse after the Lagrange is a much more serious complication than the escape of a bead of vitreous from a small trephine opening.

As to the genesis of relapse, it is instructive to compare the number of relapses after the two operations, in relation to the method in which iridectomy was performed.

Here are the figures of such relapses:

	Relapses.	
	Lagrange.	Elliot.
Total Iridectomy	9·3 per cent.	7·5 per cent.
Peripheric ,, ...	11·8 ,,	18·7 ,,
Without ,, ...	20·0 ,,	23·0 ,,

A comparison of the simple incision of the iris cannot be made, as this, which is sometimes done in the Elliot, is never done in the Lagrange operation.

It is evident, therefore, that the less the iridectomy is done, the higher becomes the percentage of relapse, which shows that the iridectomy is not such an unimportant element in the success of the sclerectomy as the champions of the "ectomy" methods would have us believe, inasmuch as they insist that the iridectomy in their methods serves only to prevent prolapse.

The effect of the iridectomy is more noticeable in the trephine than in the Lagrange operation, which may have some bearing on the question as to how much "filtration" really contributes to the regulation of the tension. The long scleral incision and the excision of a larger piece of sclera assures for the Lagrange operation a greater influence on the intra-ocular pressure regardless of the iridectomy, while Elliot's operation, with its smaller scleral opening, suggests a greater dependence upon the iridectomy.

With an equally high percentage of excellent results, the Elliot operation has a relatively much smaller percentage of bad results than the Lagrange. Further points in its favour are the considerably easier *technique*, the much smaller number of complications, especially in those forms of glaucoma in which the usual iridectomy was always feared—the severe forms of acute and absolute glaucoma. It is exactly in this latter cases that we frequently succeed with this operation in relieving the patient of his pain, and putting an end to the other deleterious results of increased tension without having to proceed to enucleation of the eye. That we can cope with many more cases of absolute glaucoma by the Elliot operation without being exposed to the various severe complications which unfortunately are well known to every operator, is evident from the fact that of the whole number of cases that we trephined, 7·7 per cent. were cases of absolute glaucoma, while only 3·4 per cent. of the Lagrange operations were cases of absolute glaucoma. Also, from the fact that with the Elliot operation only 15·4 per cent. of the absolute glaucoma cases ended badly, while 38 per cent. of such cases were entirely lost after the Lagrange operation.

Indications.

The situation, so far as the indications are concerned, has been simplified to an extraordinary degree by the introduction of the Elliot operation. It is indicated in all cases of glaucoma, in acute as well as in chronic and simple; in secondary glaucoma, and especially in those cases of increased tension, which have developed after the performance of other operations. The operation can likewise be recommended for hydrophthalmus, for it is attended with less danger than an iridectomy, or even a sclerectomy.

The height of the tension has no effect upon the course (*technique*) of the operation, or upon the development of complications, especially not that bad effect which a high tension must have in all those methods of operating in which the eye is opened by a section.

The other methods of operating will not be supplanted by it. Nor can the Elliot operation guarantee us in all cases a good result; with it also there are losses enough; with it also one is still powerless in many cases of glaucoma, and must then resort to some other method in order to accomplish our object, the reduction of the tension to the normal. Furthermore, after a trephine operation (as after all other methods) a case of glaucoma which was previously quiet and progressing only slowly, may have its course changed into a rapid and malignant one. But from our clinical experience, after a careful study of our cases, we have definitely decided to abandon the Lagrange in favor of the Elliot operation. Nevertheless, Meller does not think that Lagrange's service is by this in any way lessened. It was he who first carried into practice the bold idea of securing permanent filtration of the eye by the excision of a piece of the sclera in the region of the anterior chamber. In this sense every anterior sclerectomy continues to be the method of Lagrange. With the introduction of the Elliot trephine for this purpose the Lagrange sclerectomy was only very much facilitated and bereft of most of its dangers.

In conclusion the question arises: Is the Graefe iridectomy to be entirely displaced by scleral trephining? This question seems to presuppose a great difference between the two methods of operation, as is in fact the case. Scleral trephining is, so to speak, a convenient, technically easier, and less dangerous way of obtaining access to the iris, in order to excise it at its root after the dictum of von Graefe. That the fistulisation of the eye secured by it at the same time represents an additional curative factor forms certainly an advantage of trephining which is not to be underestimated, and which is especially adapted to those cases of glaucoma (for example, glaucoma simplex) in which the usual iridectomy cannot be depended upon. The skilled operator will stick to the approved Graefe iridectomy in those cases of glaucoma in which this operation, as has been proven, almost always produces the desired effect, but he will prefer to trephine in the cases mentioned above (high intra-ocular pressure, advanced degree of glaucoma, complicated cases of secondary glaucoma, etc.)

If a number of disadvantages and complications of both forms of sclerectomies have been here described, we should not forget that such belong in no less a degree to von Graefe's method; that indeed it was for just that reason that we have been continually searching for new methods of operating in glaucoma. It would be a mistake to lay the blame for all the disadvantages which have been described on these methods, and not equally to the Graefe iridectomy.

In order to be able to establish a more certain comparison between the two methods discussed here and the Graefe iridectomy (the data present in the literature bearing on the results of the Graefe operation are too unreliable), Meller proposes to work up in a similar manner the cases of glaucoma operated during the same years in his clinic by the method of von Graefe (which were therefore operated on under the same external conditions, and almost all by the same surgeons), and at some future time to report the result. Only then shall we obtain a positive survey of the results of the three methods. Perhaps then the indications for the different methods may be more accurately decided.

WILBUR B. MARPLE.

NEW YORK CITY, U.S.A.

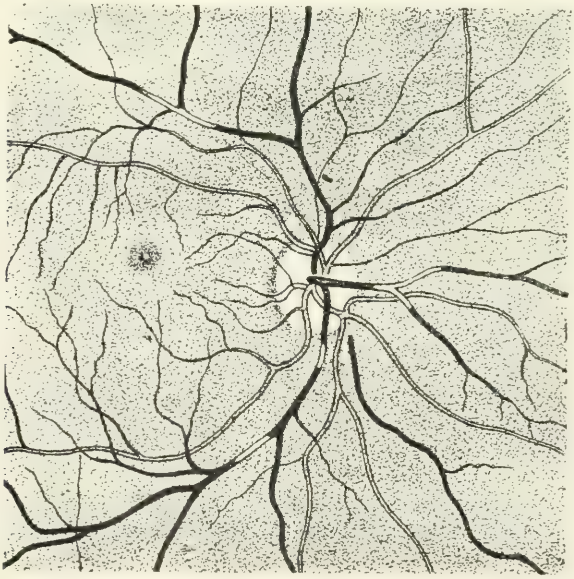
CURRENT LITERATURE.

NOTE.—Communications of which the titles only are given either contain nothing new or else do not lend themselves to abstract.

I.—POST-MORTEM OPHTHALMOSCOPY.

Kahn, Morris H.—Post-mortem ophthalmoscopy: segmentary intravascular coagulation. *Medical Record*, May 3rd, 1913.

Kahn, who is attached as resident physician to the Mount Sinai Hospital, New York, has examined with the electric ophthalmoscope a number of eyes after death, employing both the direct and the indirect methods. The pupils of some of the bodies were dilated with atropine or homatropine,* although that was often unnecessary, since, as pointed out by Kobert, the cadaveric pupil is usually dilated.



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*These drugs act upon the iris if applied to the eye prior to the onset of rigor mortis, as pointed out by Groenouw (*Klin. Monatsbl. f. Augenheilkunde*, Mai-Juni, 1911).

After death, according to Kahn's observations, the column of blood in the retinal vessels undergoes a change, the effect of which is to give the appearance of division in the column. These interruptions in calibre are seen principally in the veins, irrespective of distance from the optic disc. Variations in the length of the striations may take place while the eye is under ophthalmoscopic examination, and can be rendered more evident by making pressure upon the eyeball or by turning the head of the subject from side to side. No spontaneous alterations in the size of the segmentations can be made out for longer than about one hour after death. After the lapse of about three hours, the segmentations are influenced neither by manipulation or pressure Kahn explains the phenomena in the following way.—Intravascular coagulation of the blood, with subsequent shrinking of the fibrin, leads to the formation of spaces which contain serum. The clots thereby formed separate here and there from one another, leading to the formation of intercoagular spaces which contain the serum expressed in the process of congealing.

Details of three cases are given by the author. The accompanying figure is taken from his first case, and the drawing was made three hours after death.

[The changes undergone by the fundus oculi after death have been known since Bouchut wrote upon the subject in the year 1863. They have been studied by more than one observer. The interruption of the columns of blood within the retinal arteries and veins, giving a beaded appearance to the vessels, was described by Sir William R. Gowers in his classic work,* to go no farther afield.—S. S.] SYDNEY STEPHENSON.

II.—THE ACCOMMODATION.

(1) **Theobald, Samuel.—Some striking examples of subnormal accommodative power.** *Johns Hopkins Hospital Bulletin*, Vol. XXIV, No. 271, September, 1913.

(2) **Duane, Alexander.—Importance of testing the accommodation as a routine measure in refraction work.** *New York State Journal of Medicine*, December, 1913.

(1) In this short paper **Theobald**, of Baltimore, calls attention once again to the condition which he described in 1891 as subnormal accommodative power, and asserts that it is commoner than is supposed. The doctrine of subnormal accommodative power is based upon the observation that, while the normal balance of the lateral muscles of the eye in distant vision is one of orthophoria, in *near* vision the normal condition is one of exophoria, there being usually a relative divergence of 3 to 4 degrees. Exophoria of moderate degree at the usual reading distance is the real orthophoric condition, while "orthophoria" in its ordinary sense when present in near vision (under the vertical diplopia test) is a departure from the normal. The vertical diplopia test at the reading distance should show, as compared with the result at twenty feet, a difference in the sense of exophoria of 3 to 4 degrees. When this is not the case, subnormal accommodative power exists, and if the difference is but 0 to 1 degree, it must be taken into account in the adjustment of glasses, if the patient is to obtain comfortable near vision.

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*"A Manual and Atlas of Medical Ophthalmoscopy," 4th Edition, 1904, p. 285.

Two or three cases are related in full and the explanation comes in in connection with one of them. This patient, aged 42, had V.A. 20/15 with his refraction corrected and slight exophoria to orthophoria under the diplopia test. In near vision, even with ·62 D. sph. added, he had esophoria of 4·5 degrees. When + 1·37 D. sph. instead of ·62 D. was added to the distant correction his near muscle balance varied from "orthophoria" to ½ degree esophoria. He willingly accepted 3 degress of esophoric correction by prism for reading in addition. Of this case the author says: "It would be difficult to find a more typical example of subnormal accommodative power or a better illustration of the benefit which results from its recognition and correction. Probably because of congenital insufficiency of the ciliary muscles, an inordinate accommodative effort was required to maintain distinct near vision; but, because of the close relation between the accommodative and convergence centres, a strong stimulation of the ciliary muscles was necessarily accompanied by a corresponding stimulation of the internal recti; hence the esophoria, present only in near vision, and hence also the asthenopia, which commonly manifests itself, and is generally recognised, when the normal parallelism between convergence and accommodation is radically disturbed. The glasses prescribed, which afforded a considerably greater measure of help to the ciliary muscles than the refractive fault or the age of the patient called for, while at the same time they apreciably lessened the tension upon the hard-pressed external recti, relieved the asthenopia by restoring this normal parallelism." ERNEST THOMSON.

(2) **Duane**, of New York City, is convinced that tests of accommodation should be just as much an integral part of general refraction work as determination of the vision. In doing this we must follow a uniform plan and observe certain precautions, if the best results are to be obtained. The test object recommended has already been described by Duane in these columns (see THE OPHTHALMOSCOPE, November, 1912, p. 495). The patient's refraction having been fully corrected, and the eye not under observation having been screened off, the test object is carried toward the eye along a Prince's rule, placed against the patient's glasses and not against his cheek. The object begins to blur at the near point, and the corresponding amount of accommodation in dioptres is read off directly from the rule. The light must be good, and, if possible, come from behind the patient. The test should be repeated several times. If the near point be closer than 10 cm., a slight error in determining its position will involve an error of one or more dioptres in the value found for the range of accommodation. In such cases the test should be made both with the full correction alone and also with that correction combined with a minus 3·00 or minus 4·00 D. sphere, so as to carry the far point out beyond 10 cm. The value then found for the range must be increased by the amount of the added lens. If the near point be beyond 40 cm., as in presbyopia and homatropine cycloplegia, it must be brought within measurable distance by adding a convex glass to the patient's full correction. From the value of the range thus found, the strength of this convex addition must be subtracted.

Duane regards the routine examination of accommodation useful in three directions :—

1. In demonstrating anomalies of accommodation.
2. In determining the completeness of atropine or homatropine cycloplegia.
3. In helping to determine glasses in presbyopia.

1. The tests often bring to light anomalies of accommodation which in themselves frequently cause asthenopia and discomfort. Subnormal or ill-maintained accommodation may occur under many conditions, such as

(*a*) neurasthenia or following a debilitating illness or associated with anæmia; (*b*) in association with nasal obstruction; (*c*) as a result of diseases of the ductless glands; and(*d*) as a permanent condition due apparently to disorder of the central nervous system or to altogether unknown causes.

Subnormal accommodation may or may not be associated with insufficiency of convergence. The symptoms are those of asthenopia. Treatment is largely causal. The accommodation may be directly stimulated by practice two or three times a day with the accommodation disc and with converging prisms. Dyer's reading exercises are useful, more especially when combined with the accommodation disc. In using the converging prisms, a small dot, placed ten or twelve inches from the eye, is used as a test-object. The prisms, placed base out, are applied in the usual way, and an attempt is made to run the prism convergence for near points up to 40° or 50° at least. This exercise is particularly indicated when the insufficiency of accommodation is associated with an insufficiency of convergence.

2. Everybody knows that the time taken by homatropine to exert its full cycloplegic action varies in different cases. To determine whether cycloplegia is complete, or, in other words, if the eye is fit to be examined, we place before the patient's eye the glass representing what we believe to be his full correction, and add to it a convex glass, say, one of 3.00 D. capable of bringing the far and near points within measureable limits. These points are then determined on Prince's rule, the corresponding values in dioptres are taken off, and the range of accommodation at the time is given in dioptres by the difference between the two. If the range be found to be too great, the homatropine is continued or we wait longer for its full action. "I have used this method continuously now for six years in over 2,000 cases," remarks Duane, "and the results have been so satisfactory that I should never think of returning to the less laborious but far less certain hit-or-miss method of using homatropine, in which one examines at some arbitrary time after instillation without regard to whether the cycloplegia is complete or not."

3. By determining the near point accurately in each eye the accommodation disc often yields valuable information as to the best glass to be given in presbyopia. The glass to be prescribed will, of course, depend upon many factors. It is important, especially in the earlier stages of presbyopia, not to give a glass which will bring the far point of distinct vision too close. The near point, also, should not be brought too close, and, in general, the older the patient the further away should the near point be. Duane has worked out an empirical rule, as follows, for the most satisfactory position of the near point, which is to be estimated with the disc and not with fine print. "In patients of from 45 to 48 inclusive, if any addition to the distance correction is required for reading, the most satisfactory reading glass is one which brings the near point to between 3·5 and 4·0 D. on the scale; in patients of from 49 to 52 inclusive, one that brings the near point to between 3·3 and 3·7, and in patients of 53 to 55 one that brings the near point to between 3·1 and 3·4. Patients of 59 or over often prefer a relatively stronger glass, which brings their near point closer than 4·0.

"Any such general statement will obviously have to be modified by a consideration of the patient's refractive state, his visual acuity, his muscular relations, especially as regards convergence, his habits of reading, the kind of work he does, and the conditions under which he does it. Yet it seems to answer for most cases. In particular, I am always suspicious of a patient's acceptance of a glass which brings his near point nearer than 4·0 or, if he is over 52, nearer than 3·5 D., for such a glass is likely to cause fatigue or a sense of strain in prolonged reading. As the patient says 'the glass is too strong.'

"In testing presbyopia in this way we not infrequently find that the range of accommodation in one eye is greater than in the other, so that when we add, for example, a +2·00 to the distance correction in each, the near point in the right eye is found to be 3·50, in the left but 3·00. In such a case I always try to see whether a better result can be secured for reading by adding, say, a +2·25 to the left distance glass instead of a +2·00. Quite often it turns out that the patient does better with such an unequal addition to the distance correction, and as this fact would not have been discovered without making the accommodation tests in the manner noted, the utility of the latter is obvious." SYDNEY STEPHENSON.

III.—THE INTRA-OCULAR PRESSURE.

(1) **Hill, Leonard; Starling, H. E.; and others.—Discussion on the physiology of the intra-ocular pressure.** *Proceedings of the Royal Society of Medicine, Section of Ophthalmology*, December 4th, 1912, and February 5th, 1913.

(2) **Fourrière.—Clinical researches on the use of the Schiötz tonometer. (Recherches cliniques sur l'emploi du tonomètre de Schiötz.)** *Ann. d'Oculistique*, janvier, 1913.

(3) **Hertel, E.—Alterations of intra-ocular pressure produced by Osmosis. (Ueber Veränderungen des Augendruckes durch osmotische Vorgänge.)** *Klin. Monatsbl. f. Augenheilkunde*, September, 1913.

(4) **Zubizarreta, M.—Tonometry. Elliot's operation. The prognosis of glaucoma. (Tonometria. Operacion de Elliot. Pronostico de glaucoma.)** *Archiv. de Oftal. Hisp.-Amer.*, November, 1913.

(5) **Orr, W. F.—A clinical contribution to the pathology of glaucoma.** *Australian Medical Journal*, November 29th, 1913.

(1) We have read with much interest and considerable care the discussion on the physiology of the intra-ocular pressure opened by **Hill** and **Starling**, and contributed to by Donald, Priestley Smith, Martin Flack, Thomson Henderson, Herbert Parsons, Rayner Batten, and Greeves; but have found it impossible to make a reasonably intelligent abstract of the arguments and conflicting views of various speakers. One does not seem appreciably nearer to definite conclusions, although doubtless the discussion will bear good fruit in the future. The reader is advised to peruse the report of the discussion in full: he will not find it easy reading. The printed report extends to some forty pages of the Society's *Proceedings*. ERNEST THOMSON.

(2) **Fourrière**, working under Morax in the Lariboisière in Paris, has measured the tension of a large number of normal eyes with the Schiötz tonometer. His results may be summarised as follows.—The normal tension is usually between 16 mm. and 25 mm., but may be as low as 12 mm., and as high as 27 mm. There is no relation between the maximum or minimum arterial tension, measured with Pachon's oscillometer, and the arterial tension. The tension of the eyes in cases of anisometropia is equal, showing that in otherwise normal eyes anomalies of refraction have no influence on the tension. Massage or repeated measurements of the tension cause reduction of tension.

Holocaine (2 per cent.) causes no alteration in tension. Cocain may cause either slight and temporary hypertension or hypotension, or no alteration.

The author quotes the following results obtained by other experimenters, which he does not appear to have verified.—If the two eyes of a patient are normal, their tension is equal. There does not appear to be any relation between age and ocular tension. Atropine (1 per cent.), novocaine (2 per cent.), stovaine (2 per cent.), pilocarpine (1 per cent. or 2 per cent.), and eserine (1 per cent.) do not cause any definite alteration in the ocular tension of healthy eyes. R. J. COULTER.

(3) It has been known for some time that the administration to rabbits, *per os* or intravenously, of certain substances, such as glucose, sodium chloride, acetate, phosphate, and sulphate, causes a fall of intra-ocular pressure. It can be shown that this fall of pressure is due to osmotic abstraction of water from the interior of the eye, brought about by the high concentration of the substance in question in the blood plasma.

Hertel, of Strassburg, has been able to confirm this by chemical and physical comparison of the affected eye with the control eye removed before the experiment. He has also proved that the fall of intra-ocular pressure is not due to fall of blood pressure. The normal tension returns with readjustment of the concentration of the blood, which can be hastened by injection of isotonic or hypotonic saline solution.

The author also produced fall of pressure in the glaucomatous eyes of animals, and proceeding to man, was able to demonstrate a pronounced fall of pressure, both in the normal and in the glaucomatous eye, after intravenous injection of saline solutions.

The practical application of this fact is rendered of little account by the fact that the effect is of short duration, but it is possible that even such might be of some use. A. J. BALLANTYNE.

(4) **Zubizarreta** thinks that Schiötz's tonometer affords the best means of keeping record of the variations of the intra-ocular tension, although there are a few cases in which it cannot be applied either from the shape of the eye, staphyloma, or from the want of control of the patient. He thinks that Elliot's operation is the most simple and certain method of establishing a filtering scar, and that this is at the moment to be regarded as the operation of choice in cases of chronic glaucoma. As to the prognosis, there are some points of interest. He thinks neuropathics the worst subjects, and especially if they are also fibrotic. In addition, there are certain points in the local conditions which are important; amongst others, he lays stress on the small arterial calibre, the immobility of the conjunctiva over the sclera, and astigmatism with the rule.

(Quoted from *La Semana Médica*, Buenos Aires, July 19th, 1913.)

HAROLD GRIMSDALE.

(5) **Orr** studies the Schiötz tonometer from the physical standpoint. He points out that there is a physiological inexactitude corresponding to the weight of the instrument (less that of the piston-rod and weights employed) applied to the eye. Moreover, the zero reading varies with the curvature of the surface to which the foot-plate is applied. The latter point was studied on steel spheres, on artificial eyes, measured with the ophthalmometer, and on living human eyes. In the last case the steel piston-rod was replaced by a light vulcanite rod. In view of the fact that the radius of the cornea rarely varies beyond the range of from 7 mm. to 8·2 mm., his experiments show that the probable variations in the readings obtained from eyes with ordinary corneæ do not pass beyond 1 or 1·5 markings of the scale. Thirdly, he finds that the readings vary with the resiliency of the cornea; consequently, those

taken on a conical cornea are far too low. For practical purposes we can disregard the error due to the weight of the instrument, so long as we keep our readings to the first five divisions of the scale (as Schiötz recommends should always be done). We can probably assume the resiliency of the cornea to be approximately the same in ordinary eyes, and therefore neglect it. The mean of three readings should always be taken, and even then an error of 1 to 1·5 divisions of the scale is possible ; this implies an error of from 3 mm. of Hg. in the lower tensions to 10 mm. of Hg. in the higher.

Orr's conclusion, after making a large number of investigations on human and animal eyes, is that the Schiötz instrument is of practical value for clinical purposes, although the absolute value stated in mm. of Hg. may not be trustworthy within fairly wide limits, as compared with intra-ocular manometric readings. The weak point in the latter method is that if the needle is introduced into the anterior chamber, the curvature of the cornea is altered, whilst if into the vitreous, the needle is apt to become choked up.

Starting from the above work as a basis, Orr proceeds to draw a number of conclusions as to the relationship between increase of intra-ocular pressure (which he evidently looks upon as a thing apart) and glaucoma (which he regards as a disease).

Even those who find it hard wholly to agree with him will read the paper with interest. R. H. ELLIOT.

IV.—OPERATIONS.

10.—Elliot's Operation.

Kümmell, R.—On the anatomical behaviour of the cicatrix following Elliot's trephining upon rabbits. (Ueber das anatomische Verhalten der Narben nach Elliotscher Trepanation bei Kaninchen.) *Bericht der Ophthalmologischen Gesellschaft*, Heidelberg, 1913, p. 205.

Kümmell, of Erlangen, read a paper before the Heidelberg Congress describing the results of his investigation of the changes which take place in the site of a trephining operation in rabbits. The operation presents peculiar difficulties in these animals ; iris prolapse is frequent, and when iris is excised, the ciliary body is apt to follow. It is also easy to buttonhole or to tear the conjunctival flap. In all cases the hole becomes filled with cells, fibrous tissue is formed, and eventually a compact scar results.

Discussion.

The discussion which followed the reading of the paper was a valuable one.

Stock, of Jena, cited two failures in which he had examined the eyes. In one there was an ectatic scar but the conjunctiva was so bound down by adhesions that the fluid which left the eye could not escape, and in consequence there was no reduction of tension. In the second case the orifice had healed up solidly. The operation was by no means a certain cure for high tension, but it was better than iridectomy, and he would not care to be without it.

Uhthoff, of Breslau, showed a specimen exhibiting solid healing of a trephine hole. The preparation also demonstrated the fact that owing to extensive obliteration of the angle of the chamber, it was impossible to fulfil the *technique* of the operation.

Wagenmann, of Heidelberg, regarded the operation as a valuable addition to our operative methods, but like iridectomy and other operations, it was apt to be followed by complications. The effect of lowering pressure is sometimes ephemeral, and the trephine must be used again. In malignant glaucoma the condition may be aggravated, as after iridectomy, because the anterior chamber is not reformed. The danger of late infection is ever present, and Wagenmann related a case of this complication.

Holth, of Christiania, showed some preparations which demonstrated the conditions found after the punch operation. These are illustrated in the plates attached to the *Reports*. The first case died six months after the operation, which was a punch sclerectomy with iridencleisis. The ciliary body lay bare at the base of the aperture, which formed a permanent fistula lined with pigment cells. The second case died three years after punching with iridectomy. The ciliary body was shielded by the posterior lip of the incision made with the keratome. A well-developed fistula was lined with pigment cells. The third specimen, again, showed a fistula lined with pigment cells. Holth laid great stress upon the value of an iridectomy. This addition allowed the iris pigment cells to wander out and to line the fistula, keeping it patent.

Schnaudigel, of Frankfurt a/M., said that the behaviour of the scar depended greatly upon the character of the sclera. In myopic eyes with a thin sclera the fistula was always a permanent one, and tension never rose again. In one case in which several operations had failed, he made three holes side by side. The case was cured.

Guttmann, of Berlin, trephined an eye behind the ciliary body. An iridectomy had left a cystoid scar, but after some time, tension rose again. The posterior sclerectomy proved successful.

Heine, of Kiel, found that cyclo-dialysis was useful in secondary glaucoma following cyclitis, cases in which the healing of wounds was unsatisfactory.

T. HARRISON BUTLER.

II.—Sclerotomy and Sclerectomy.

(1) **Wicherkiewicz.—Further experiences with my reticular sclerotomy. (Weitere Erfahrungen über meine Gittersklerotomie.)** *Bericht der Ophthalmologischen Gesellschaft*, Heidelberg, 1913, p. 196.

(2) **Holth, S.—Further experiences with præ-æquatorial sclerectomy in retinal detachment and myopia. (Weitere Erfahrungen mit Sclerectomia præ-æquatorialis bei Netzhautablösung und Myopie.)** *Bericht der Ophthalmologischen Gesellschaft*, Heidelberg, 1913, p. 179.

(3) **Aurand.—A case of retinal detachment improved by simple sclerectomy. (Un cas de decollement de la rétine amélioré par la sclérectomie simple.)** *La Clinique Ophtalmologique*, 10 octobre, 1913.

(1) **Wicherkiewicz,** of Cracow, after another year's practice of his reticular sclerotomy, still finds the operation useful in certain types of glaucoma. He believes that in many examples of the disease the rise of tension is due to rigidity of the sclera rather than to the choking of the excretory channels in the anterior segment of the globe. It is in these cases, and also in patients who have received no benefit from the ordinary methods of treatment, such

as iridectomy and the attempt to form a filtering cicatrix, that Wicherkiewicz has found his method valuable. The exact *technique* of the procedure is shown by two illustrations in the *Reports*. The sclera is exposed between the insertions of the recti, and it is then incised by four to six strokes of a Graefe knife. These parallel slits are now crossed by an equal number of incisions at right angles to the original direction. If the sclera is found to be unduly thick, every alternate cut is deepened down for a length of 2 to 3 mm. The original cuts are 10 to 12 mm. long. The conjunctiva is now united by sutures. The vitreous has never escaped, but if it did so, the author thinks that no harm would ensue. T. HARRISON BUTLER.

(2) **Holth**, of Christiania, at the Heidelberg Congress, in 1912, gave an account of his operation of præ-æquatorial sclerectomy performed either with a trephine or a punch which he had devised for the treatment of high myopia and retinal detachment.

At the Congress held last August, at Heidelberg, he gave some further details of the operation and some account of the results obtained. A drawing is given in the abstract of his paper contained in the *Reports* of the Congress which shows the situation usually chosen for the sclerectomy. Another wood-cut illustrates Holth's guarded trephine. The well-known Holth punch is also portrayed.

An examination of the cases cited leads to the conclusion that the results obtained are so far not very promising.

Holth states with, reference to detachment, that in cases where a rupture of the retina is present, permanent cure has never been obtained. He is of opinion that when no rupture can be detected, the operation offers considerable hope of success and should always be attempted. The patients operated upon were not kept in bed, and generally returned home in about a week. Perhaps, he says, if the operation were combined with rest in bed, the effect might be better and more permanent. The prognosis is best in cases of flat detachment.

As regards myopia, the only good results recorded were in patients who had a posterior staphyloma. He thinks that in one case he succeeded in warding off a threatened detachment.

Discussion.

In the discussion which followed **Franke**, of Hamburg, said he had performed Holth's operation upon three cases of detachment, all of which showed tears in the retina. All the patients were worse after the trephining. One case manifested a temporary improvement, but the original condition recurred. The other two gradually became blind. He had seen the operation performed upon a fourth patient, who was made worse. Under the circumstances he should not continue to employ Holth's method.

Hirschberg, of Berlin, had seen a case of detachment with retinal rupture recover under ordinary treatment. **v. Hippell, jun.**, of Halle a. S , said that it was often very difficult to say that no tears in the retina were present, as they might be hidden behind a retinal fold. Holth himself pointed this out in his paper. **Schnaudigal**, of Frankfort a. M., had trephined four cases of amotio retinæ. In all there was flat detachment with no visible tears. In each case after 48 hours the ophthalmoscope showed that the retina had subsided into its normal position. No defect was found in the visual fields. In all detachment recurred in four or five days, even in two cases in which the operation was repeated. T. HARRISON BUTLER.

(3) In a case of idiopathic detachment of the retina (myopic) **Aurand**, of Lyons, obtained a relative cure, which had lasted more than five months at

the time of writing, by the performance of the operation of Bettremieux. It will be remembered that this non-perforative sclerectomy consists in shaving away a number of layers of the scleral tissue at the limbus corneæ, and then covering the wound with the conjunctival flap which has been raised as a preliminary. The *rationale* of this operation is that it facilitates the issue of blood from the eye in the neighbourhood of the canal of Schlemm and lowers the capillary tension in the whole of the anterior part of the uveal tract, thus favouring the evacuation of the sub-retinal fluid. ERNEST THOMSON.

V.—SPOROTRICHOSIS.

(1) **Morax, V.—Primary sporotrichosis of the eyelids simulating a lacrymal fistula. (Sporotrichose primitive des paupières simulant une fistule lacrymale.)** *Ann. d'Oculistique*, mars, 1913.

(2) **Fava, Attilio.—Experimental sporotrichosis of the lacrymal apparatus of the rabbit. (Sporotrichosis expérimentale de l'appareil lacrymal du lapin.)** *Ann. d'Oculistique*, mars, 1913.

(1) **Morax**, of Paris, records a case of primary sporotrichosis of the eyelids simulating a lacrymal fistula. The patient, a man aged 37, stated that he had noticed a lump below the internal commissure of his left eye for a month, and that about ten days before his first visit, it had ulcerated and discharged a little pus. It had been painless throughout, and he had never suffered from lacrymation. On examination, an oval lesion of a reddish-violet colour, measuring 10 mm. by 7 mm. and projecting 2 mm. above the surface of the skin, was found just below the left internal lateral ligament. This had a depression on its surface resembling a lacrymal fistula, and was of a softish consistence and easily movable. There was no cutaneous reaction around it, and the lymphatics were not enlarged, but there was painless enlargement of the preauricular gland. There was no connection between the lesion and the lacrymal passages, which were healthy. Culture experiments showed that the lesion was due to infection with a sporothrix, and treatment with iodide of potassium was followed by rapid improvement. The Wassermann reaction was negative. R. J. COULTER.

(2) **Attilio Fava**, continuing his researches on experimental sporotrichosis in the Institut Pasteur at Paris, injected cultures of *Sporotrichum Beurmannii* into rabbits: (1) through the skin into the tissues surrounding the lacrymal sac; (2) through the punctum lacrymale into the sac, the wall of which was scratched with the needle used for making the injection. In both regions he succeeded in producing definite sporotrichomata. The sporotrichosis of the lacrymal sac was accompanied by a conjunctivitis due to infection with the same organism but without any formation of gummata. Typical "*corps en navettes*" were found in sections of the sporotrichomata, but in smears of the secretion from the conjunctiva and lacrymal sac these were replaced by filaments. Fava had previously found a similar difference between the organisms in the cornea and iris and those in the aqueous. He considers that the variable form of the parasite depends on conditions the nature of which is not yet definitely established. R. J. COULTER.

VI.—INJURIES.

(1) **Vogt, A.—Some eye-injuries by broken spectacle lenses. (Einige Augen-Verletzungen durch Brillenglas-Scherben.)** *Centralbl. f. prak. Augenheilkunde*, Dezember, 1912.

(2) **Oguchi, Ch.—Injuries to the eye in the Japanese army during the last (Russo-Japanese) war. (Augenverletzungen im japanischen Heere während des letzten Krieges.)** Deutschmann's *Beiträge zur Augenheilkunde*, Heft lxxxiii, 1913.

(3) **Sym, William George.—Injuries of the eye.** *Edinburgh Medical Journal*, March, 1914.

(1) Eye injuries caused by accidents to eyeglasses or spectacles are generally considered to be very rare, and certainly it is remarkable how seldom children, for instance, seem to be injured by the spectacles which are so universally worn. **Vogt**, of Aarau, has been able to collect five cases of such injury in about 700 cases of accidental injury to the eye, and they all presented the character of punctured or clean-cut wounds, which, on the whole, healed well, *i.e.*, without septic infection. A. LEVY.

(2) This paper, by **Oguchi**, of Tokio, runs to over 200 pages, and forms a very detailed report on the eye injuries met with in the Japanese army, excluding those which were too trifling to be admitted to hospital, and those occurring in combatants who were killed in action.

The first section treats the material from the statistical standpoint. The cases of eye injury met with in action numbered 2,910, and to these are added 688 cases of injury not connected with the fighting. The number of eye injuries was enormously greater than that of any previous great war of which particulars can be obtained, and the proportion of eye injuries to other injuries was also greater. About half of the injuries were the result of rifle shots, and about a quarter were due to cannon shots. Explosions were also a common cause of accident to the eye, and other causes of injury were bayonet and sabre cuts, bombs, stones, and other missiles.

The injuries are classified in many different ways: whether received in fighting or otherwise, whether in the field or in the fortress, the cause of the injury and the nature of the wounds, the distance of the enemy, the attitude of the victim, the eye involved, the visual results, the presence or absence of sympathetic ophthalmia, further fitness of the patient for service, etc.

The impossibility of abstracting this part of the work may be gathered from the fact that it comprises nearly seventy tables, in which these factors are combined in various ways.

In the second part of the work the injuries are considered from the point of view of regional classification; injuries of the cornea, sclera, iris, etc., being taken in turn, and each form of injury illustrated by brief case-histories. Altogether, nearly 500 cases are quoted in this way, and they comprise every conceivable form of injury, many of them rarely or never seen in civil practice.

The third part deals with the matter from the pathological aspect, and comprises case-histories and pathological reports on the eyes enucleated on account of injury. A series of plates, containing seventy-six figures, illustrates this portion of the book.

From the nature of the material dealt with, and the fact that no attempt is made to discuss principles or to advance views of any kind, it will be seen that

Oguchi's work does not lend itself to abstract or criticism ; but it is a painstaking and thorough analysis of a very large number of interesting cases, and it cannot fail to be of value as a work of reference to those interested in injuries of the eye. A. J. BALLANTYNE.

(3) A capital article by **Sym,** of Edinburgh, describing the treatment of various common injuries of the eye in such a way as to be of service to the general practitioner of medicine. He gives the useful caution not to employ a syringe with the idea of washing out particles of dirt in cases where foreign bodies are driven into the orbit alongside the eyeball. The result might be to spread the offending material among the tissues of the orbit, in which suppuration occurs " with dreadful readiness." After removal of a foreign body from the cornea, more especially from a patient whose conjunctiva is suspect—as, for example, a miner—it is advisable to apply an antiseptic ointment, such as corrosive sublimate, 1:5,000. Should pus be already present in the anterior chamber, Sym applies pure carbolic acid to the corneal lesion by means of a sharpened wooden match. The author would never enucleate an eyeball simply because it was ruptured, since the risks of keeping it are infinitesimal, and any change that may take place will almost certainly be for the better. No attempt should be made to suture the iris in a case of traumatic iridodialysis. A recently prolapsed iris may be freed from the cornea, drawn out, and then cut off close to the corneal surface. But once the iris is incorporated in a healed or healing scar it cannot be loosened, and then had best be left alone. The same applies with equal force when the wound is in the sclera and the ciliary body prolapses. Sym explains how wounds either of cornea or sclera may be covered with conjunctiva, and speaks highly of the results that may sometimes be obtained by that plan. The flap or apron of conjunctiva not only keeps the lips of the wound in place, but cells from its deeper surface also take part in the formation of the occluding cicatrix. Punctured wounds are more dangerous than incised wounds of the eyeball. The two main dangers of an open wound are primary suppuration and sympathetic ophthalmia. The subconjunctival injection of four or five minims of mercury cyanide, 1 to 3,000, may effect an astonishing improvement in the state of an eye threatened with suppuration. There are four features of an eye injured a few weeks previously that should put one on the guard against the advent of sympathetic ophthalmitis, as follows :—1, persisting injection ; 2, declining vision ; 3, lowered tension ; and 4, tenderness to touch. Few cases of sympathetic disease appear until three weeks have elapsed from receipt of the injury, and not many after two months.

SYDNEY STEPHENSON.

VII.—FAMILIAL DEGENERATION OF THE MACULAR REGION.

Stargardt.—On familial progressive degeneration in the macular region of the eye. (Ueber familiäre, progressive Degeneration in der Maculagegend des Auges.) *Zeitschrift für Augenheilkunde*, August-September, 1913.

Stargardt, of Kiel, describes a peculiar variety of macular degeneration which he has observed in several members of three families. A similar disease has also been observed independently by Lutz. The process commences with the appearance of slight irregularity in the pigmentation of the macular region. Then delicate yellowish-gray spots appear which gradually increase in size, and coalesce to form a sharply demarcated oval patch in the macular area, whose horizontal diameter equals two, and whose vertical diameter equals one-and-a-half disc-diameters. The disease gradually causes total loss of all central vision. Similar, if not identical, conditions have been described by Stirling and Valude. Oatman notes definite macular changes in certain forms of imbecility, and his observations agree with those made by Batten, Mayou, Sydney Stephenson, and Hirschberg. Oatman speaks of a "maculo-cerebral type" of disease. R. W. Doyne's two sisters with macular choroido-retinitis are mentioned, but Stargardt thinks that the changes were degenerative rather than inflammatory.

In these cases the Wassermann reaction has excluded syphilis as an ætiological factor, and the author thinks that we must ascribe them solely to the influence of heredity. T. Harrison Butler.

VIII.—UVEITIS.

(1) **Galezowski, J. and Berche.—Iridocyclitis after ovarian castration. (Iridocyclite après castration ovarienne.)** *Recueil d'Ophtalmologie*, avril, 1911.

(2) **Grandclément.—A further note on iridic uveitis. (Encore un mot sur l'uvéite irienne.)** *L'Ophtalmologie Provinciale*, janvier, 1912.

(3) **Charles, J. W.—Hyalitis caused by (a) Pus-absorption and (b) Intestinal auto-intoxication.** *American Journal of Ophthalmology*, March, 1913.

(4) **Guibert.—The rôle of gastro-intestinal intoxication in iritis. (Du rôle de l'intoxication gastro-intestinale dans l'iritis.)** *La Clinique Ophtalmologique*, 10 octobre, 1913.

(5) **Levy, A.—On cases of chronic irido-cyclitis.** *The Polyclinic*, December, 1913.

(6) **Fuchs, Ernst.—The pathogenesis of chronic uveitis, excluding the syphilitic, tuberculous, and sympathetic varieties.** *XVIIth International Congress of Medicine, London*, 1913. *Section IX, Ophthalmology*. Part i, p. 1.

(7) **de Schweinitz, G. E.—The pathogenesis of chronic uveitis, excluding the syphilitic, tubercular, and sympathetic varieties.** *Ibidem*, p. 7.

(1) **Galezowski**, of Paris, describes briefly the disturbances of the visual apparatus which have been ascribed to normal menstruation, to the sudden cessation of menstruation during the period of functional activity, and also the effects of its physiological cessation at the menopause, and its pathological arrest after ovarian castration. It would appear that ocular symptoms are frequently associated with the physiological menopause, but that they have seldom been recorded as the result of a menopause surgically established. Among visual troubles ascribed to ovarian castration and hysterectomy the following have been described:—visual impairment, sudden blindness, increase of myopia and reduction of visual

acuity and retraction of visual fields without any lesion of the fundus, double optic neurits with papillary stasis, optic atrophy with auditory troubles, acommodative asthenopia. Inflammation of the uveal tract, although often met with after the menopause, has not hitherto been described as an after-effect of ovarian castration. Galezowski, however, records five cases in which uveal inflammation followed the removal of the ovaries. The type of the ocular lesion is generally a quiet iridocyclitis with dimness of vision, but with little congestive symptoms, or pain, appearing generally in the two eyes successively.

The numerous deposits which appear on the back of the cornea indicate the nature of the pathological process which gives rise to the impairment of vision, and this is further shown by the appearance of posterior synechiæ, vitreous opacities, and hyperæmia of the optic disc. Inflammatory symptoms are liable to exacerbations and become subacute during the times when menstrual periods should be due. The symptoms are very persistent, and may eventually lead to extensive choroiditis with atrophy of the globe and detachment of the retina. The symptoms are ascribed to insufficiency of the ovarian internal secretion, and are relieved by the administration of ovarian extracts. The onset of the symptoms may be delayed for from two to five years.

J. JAMESON EVANS.

(2) **Grandclément**, of Lyons, described this form of iritis in 1891 in a communication to the French Society of Ophthalmology. He now makes a further contribution to the subject.

He holds that the condition differs from chronic iritis, with which it has been confused in the past. Its progress is slow and insidious. The attacks come on at periods of twenty to ten days and last about one or five days. The eye is slightly injected, and the patient complains of a mist before the eyes, with a peculiar phosphorescent twinkling. Each attack diminishes the vision slightly. Advice is not sought until the disease has been present for a year or two.

Examination then shows that there are several posterior synechiæ, a few vitreous opacities, and a hazy disc. It is a disease nearly always found in women; there is no history of syphilis, rheumatism, or uterine disorders. The layer of the iris affected is the pigmented posterior layer, which is the continuation forward of the retinal pigment layer. During an attack, however, the whole uveal tract is involved, and the ciliary region is sensitive to pressure. He compares the relation of this inflammation of the uveal layer of the iris to iritis as pleurisy is to pneumonia. He shows how this condition differs from true iritis, which is easily cured by treating the cause and giving atropine and subconjunctival injections. Iridic uveitis will not respond to this treatment, even in the early stages, and the only treatment of value is iridectomy. Grandclément mentions that Jonathan Hutchinson, junior, described the same condition in 1892 or 1893 and called it "quiet iritis."

P. A. HARRY.

(4) **Guibert,** of La Roche-sur-Yon, has had three patients in whom the only known cause for iritis (at least, one must conclude he had eliminated other causes, although he does not certainly say so) was gastro-intestinal, and in whom the exhibition of lactic ferments had a most remarkably curative effect upon the iritis.

ERNEST THOMSON.

(5) In the course of a somewhat pessimistic communication, **Levy,** of London, expresses the opinion that injections of tuberculin do not seem to be of any very great value in most cases of tuberculous irido-cyclitis. He urges the importance of the early recognition of chronic irido-cyclitis, whether syphilitic, tuberculous, or "septic." Treatment should be prompt and vigorous. In some cases subconjunctival injections of sodium chloride (5 per

cent. to 10 per cent.) do good, and in occasional cases benefit may accrue from mercurial inunctions, together with the production of diaphoresis by pilocarpine. Levy ends his article with the following words :—" But in spite of everything, many cases will continue to progress, and end in the ultimate destruction of the eye." SYDNEY STEPHENSON.

(6) For abstract of **Fuchs's** communication, see page 231 of the current number of THE OPHTHALMOSCOPE, under the head of " Pathology."

(7) This communication by **de Schweinitz,** of Philadelphia, which occupies fifty pages of the volume of reports of the section of ophthalmology of the XVII International Congress of Medicine, is emphatically one to be read and not to be abstracted. It discusses chronic uveitis (excluding the syphilitic, the tuberculous, and the sympathetic varieties) from the clinical and the bio-chemical standpoints. Some idea of its comprehensiveness may be gathered from the bare enumeration of the material employed in its compilation. This includes : (1) an analysis of some of the most important literature published during the last ten years ; (2) a collective investigation of the views and experiences of American observers in this and allied diseases of the uveal tract ; and (3) a study of so-called gastro-intestinal auto-intoxication in relation to those affections.

The communication is so important that no apology need be made for transcribing de Schweinitz's conclusions, which are as follows :—

" Inasmuch as acute articular rheumatism (rheumatic fever) is rarely, if ever, a cause of iridocyclitis (uveitis), and inasmuch as various types of myalgia (muscular rheumatism) and polyarthritis are in largest measure not strictly rheumatic affections, it seems advisable to discontinue the term ' rheumatic iritis,' or ' iridocyclitis,' and to substitute for it some title which does not commit us to an unproven ætiologic factor. Thus far, the one suggested by Mr. T. Harrison Butler, to wit, ' autotoxæmic iritis,' although not a definite one, seems best to fulfil the indications.

" Uveitis (iritis and iridocyclitis) occurring in the subjects of various forms of polyarthritis is doubtless due to the same cause which creates the joint affections ; what the cause is, thus far has not been discovered. Similar ocular affections in the subjects of various myalgias (muscular rheumatism), should probably be regarded as manifestations of the same infection or toxæmia which causes the muscle- and fibrous-tissue pains and lesions, and, although the so-called rheumatic diathesis has been brought forward as an ætiologic factor in this disease, in the absence of definite knowledge concerning its pathogenesis, a more explicit statement as to its causation, and therefore as to the causation of the iridocyclitis with which it may be associated, cannot be made.

" Evidence is lacking that the relationship between gout and various diseases of the uveal tract (uveitis, iridocyclitis) should be abandoned, in that no satisfactory proof has been presented, that the same cause which produces the various manifestations of gout, for example, eczema, joint lesions, &c., may not also produce a chemic inflammation of the uveal tract. It is not unlikely that diabetes, but much more rarely, can be accused in the same manner.

" There is satisfactory evidence, clinic and bacteriologic, that the majority of cases of uveitis (iridocyclitis) are caused by micro-organisms or their toxins. Potent in this respect (omitting those excluded from this discussion) the gonococcus and the staphylococcus are conspicuous. Other bacterial elements doubtless may play a similar *rôle*.*

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* As Axenfeld has pointed out, it is difficult and often impossible by the ordinary tests to eliminate the influence of tuberculosis.

"That the gonococcus is the cause of many cases of iritis and irido-cyclitis is unquestioned, but that it is the cause of many cases ordinarily classified as "rheumatic," is undoubtedly true; that it may be the cause of chronic insidious uveitis, especially as it occurs in women, has not been definitely proved, but it cannot be entirely excluded from the list of those micro-organisms which are potent factors in this disease.

"The primary source of infection from which the staphylococcus proceeds and reaches the uveal tract, there to create an inflammation, in all probability, most frequently, is a chronic septic process in the mouth (pyorrhœa alveolaris), in the tonsil, in the naso-pharynx, in the accessory nasal sinuses, in the intestines, in the uterine cavity, in the skin (boils, furuncles, &c.).

"It is probable, that in most instances, the living bacteria reach the uveal tract, and by their presence and their elaborated toxins bring about the various types of inflammation which are classified under the general term 'uveitis,' the process being a non-suppurative one on account of the modification which these bacteria undergo in their passage through the blood-streams.

"Although the term 'inflammation,' as ordinarily defined and conceived, comprehends a pathologic condition characterized by the presence of bacteria at the site of activity, there is much evidence to show that lesions possessing all the fundamental characteristics of similar lesions which result from the immediate action of living bacteria can be brought about by bacterial toxins, and that in these lesions there is nothing to suggest that in the course of their development bacteria were immediately present (Abbott). Therefore, while proof may be lacking that bacterial toxins circulating in the blood are capable of causing localized inflammations of the uvea, proof is equally lacking that such is not the case. Indeed, we are not justified in denying that these toxins have this power, unless we are also willing to reject the theory of specific combining affinities.

"As it is possible to speak intelligently of auto-intoxication only when poisons are formed by the tissues of the body itself, that is, within the metabolism, and are not introduced through specific bacterial infections, and as we have no accurate knowledge of these toxins, it would seem wise to discontinue the term 'gastro-intestinal auto-intoxication,' although freely admitting that gastro-intestinal intoxications of bacterial or parasitic origin are potent sources of infection.

"Although indican, when found in excessive amounts in the urine (indicanuria) is an index of intestinal putrefaction, its absence does not prove that a gastro-intestinal intoxication is not present, nor is it proper to depend upon the presence of this substance alone for information in these respects. If, after thorough analysis, urobilin, phenol, increase in the percentage of ammonia output, excess of fatty acids and increase of conjugate sulphates above 200 mgm., &c., are determined, intestinal putrefaction dependent upon the activity of bacteria on the food-stuffs in the intestines has been demonstrated. These analyses do not in any way prove that any toxic substance elaborated in the course of a so-called gastro-intestinal auto-intoxication that is, a toxin formed within the metabolism, can by its toxic properties produce a uveitis, but they do prove the bacterial activity to which reference has been made, and indicate a source from which these bacteria or their toxic products may proceed, and cause an inflammation of the uveal tract, exactly as bacteria or their toxins from other foci have a similar influence. In this sense, therefore, gastro-intestinal intoxications have a definite right to be included among the ætiologic factors of uveitis.

"Chronic insidious uveitis, especially as it occurs in women, who are often anæmic, is in all probability most frequently excited by bacteria or bacterial toxins which have come from foci of chronic sepsis, particularly in the mouth, the tonsils, the sinuses, the pelvis, and the gastro-intestinal tract.

'While indicanuria certainly has not been proved to have the relationship to the development of certain types of chronic and relapsing uveitis (iridocyclitis) that has been given to it by some writers, there is good reason, as Elschnig insists, to study patients with these diseases of the eye from the metabolic standpoint. This study, however, should not be confined to the ordinary tests for indican in the urine, but should include a thorough investigation of the patient's metabolism. It is probable that such studies may eventually lead to the establishment of a definite group of diseases of the uveal tract called into existence by infections of bacterial origin arising in the intestinal tract."

IX.—PATHOLOGY.

(*Second Notice.*)

(1) **Velhagen.** - **A rare form of fibroma molluscum of the eyelid. (Eine seltene Form von Fibroma molluscum am Augenlid.)** *Centralbl. f. prak. Augenheilkunde*, Februar, 1912.

(2) **Takashima, S.—Five cases of congenital hydrophthalmos, with special reference to the pathological anatomy. (Fünf Fälle von Hydrophthalmus congenitus unter besonderer Berücksichtigung des pathologischanatomischen Befundes.)** *Klin. Monatsbl. f. Augenheilkunde*, Juli und August, 1913.

(3) **Löwenstein, Arnold.—The histology of diplobacillary ulcer of the cornea; a contribution to our knowledge of abscess formation on the posterior surface of the cornea. (Ueber histologische Befunde beim Diplobazillengeschwür der Hornhaut; ein Beitrag zur Kenntnis der Abszessbildung an der Hornhauthinterfläche.)** *Klin. Monatsbl. f. Augenheilkunde*, September, 1913.

(4) **Stölting, B.—Internal rupture of the sclera, with remarks on ring abscess. Postscript to my article in "Klin. Monatsbl. f. Augenheilkunde," Juli, 1913. (Nachtrag zu meiner Arbeit "Ueber innere Skleralruptur nebst Bemerkungen über den Ringabszess.")** *Klin. Monatsbl. f. Augenheilkunde*, September, 1913.

(5) **Rados, Andreas. — Cavernous degeneration of the optic nerve. (Ueber die kavernöse Sehnervenentartung.)** *Klin. Monatsbl. f. Augenheilkunde*, September, 1913.

(6) **Fuchs, Ernst.—The pathogenesis of chronic uveitis, excluding the syphilitic, tuberculous, and sympathetic varieties.** *XVIIth International Congress of Medicine, London*, 1913. *Section IX, Ophthalmology*, Part I, p. 1.

(1) The peculiarity of the case which **Velhagen**, of Chemnitz, reports consists in the peculiar form of tumour, which affected a woman aged 60 years. The tumour appeared thirty years previously, and grew very gradually, until when seen it formed a pear-shaped mass hanging by a narrow stalk from the edge of the upper eyelid near the caruncle. It was

30 mm. long and 25 mm. at its greatest width. It was easily removed, and, when examined, proved to be a peculiarly well-marked example of v. Recklinghausen's neuro-fibromatosis. A. H. LEVY.

(2) **Takashima,** of Saga, Japan, discusses the pathological findings in five cases of congenital hydrophthalmos. The ages of the patients ranged from nine to fourteen. Only one eye was affected in each case, and the enlargement of the globe had been observed shortly after birth. The corneal diameter was always enlarged, and the anterior chamber deep.

On the whole, the pathological changes were similar in all the cases.—The corneæ showed more or less pronounced interstitial infiltration. Some specimens showed changes in Bowman's membrane or its epithelium. Descemet's membrane was either thinned or, in addition to thinning, presented dehiscences. Other changes were thinning and atrophy of the choroid, atrophy of the ciliary body, iritis, narrowing or obliteration of Schlemm's canal, obliteration of the angle of the anterior chamber, cupping of the disc, and atrophy of the optic nerve.

A good deal of attention is devoted to the question of the measurements of the eyeball, which are given in detail for all the cases. These show that, while the enlargement of the eyeball is associated with thinning of the anterior part of the sclera, the posterior segment of the sclera not only does not show the thinning which one would expect to find, but is usually relatively, and may be even absolutely, thickened, in comparison with the normal sclera of the same age. These statements are also supported by an analysis of the cases to be found in literature. In one or two cases described as hydrophthalmos the posterior segment of the sclera was thinned. These the author would describe as cases of complicated myopia. He raises, but does not give a definite answer to, the question, whether the enlargement of the globe is to be looked upon as a giant overgrowth of the eyeball, or as purely resulting from stretching due to elevated intra-ocular pressure. He seems to lean to the former suggestion. A. J. BALLANTYNE.

(3) **Löwenstein,** of Prague, has had the opportunity of making microscopic examinations of two eyes affected with diplobacillary ulcer, the results being here described and illustrated.

In the first case there was, clinically, no loss of substance, and microscopically, in spite of the defect, the affected part of the cornea was actually thickened by one-half. There was no undermining of healthy cornea, and the cellular infiltrate did not extend further than the surface defect. The infiltration, which was chiefly polymorph, formed two zones, superficial and deep, and in a situation corresponding to one edge of the ulcer, there was an abscess-like collection of cells lying in front of Descemet's membrane and separated from the deep zone of infiltration by a narrow clear area. There was, of course, loss of epithelium and Bowman's membrane, but Descemet's membrane was intact. Diplobacilli were found in chains in the part of the corneal stroma underneath the necrotic floor of the ulcer, but not in the deeper zone of infiltration, in the abscess, or in the anterior chamber. The tissues in the neighbourhood of the organisms showed remarkably little evidence of reaction, and the organisms themselves were free from signs of degeneration. The author points out how markedly this picture differs from that of the pneumococcus ulcer, with its intensely infiltrated growing edge, its deep loss of substance, the evidence of severe tissue reaction as well as destruction of the invading organisms, and the absence of the deeper infiltrate described above.

The second case described is not so typical as the first, owing to the presence of pannus and other complicating conditions. A. J. BALLANTYNE.

(4) **Stölting,** of Hanover, has seen a fresh case of ring abscess of the cornea following perforating injury. The condition went on to panophthalmitis, and the eye was exenterated after removal of its anterior segment. Examination of microscopic sections convinces him that the infection of the cornea found its way from the anterior chamber by the normal filtration channels to Schlemm's canal, and set up cellular infiltration in its neighbourhood, thus supporting the view previously expressed as to the origin of ring abscess. He also thinks that the progress of the case showed the value of drainage of the anterior chamber in the treatment of this condition. A. J. BALLANTYNE.

(5) **Rados**, of Budapest, has had an opportunity of examining microscopically the eyes from two cases showing cavernous change in the optic nerves, and takes occasion to discuss the probable ætiology of the condition. The cases were not strictly similar, but resembled each other in presenting thrombosis of the central vein with secondary glaucoma. There were also pronounced changes in the retinal vessels. His view of the pathogenesis is that the thrombosis led to congestion and to œdema, and that this, in turn, caused the cavernous change. At the same time he thinks that there are other forms of circulatory disturbance that might bring about the same result.

A. J. BALLANTYNE.

(6) There are three ways of investigating the pathogenesis of chronic uveitis, namely, clinical observation, experiments on animals, and anatomical examination. In the present communication **Fuchs,** of Vienna, confines his attention to the third method.

Chronic uveitis includes such cases as run their course almost or quite without inflammatory symptoms, so that the patient is conscious only of a failure or disturbance in sight. Apart from syphilitic, tuberculous, and sympathetic cases, Fuchs recognises three clinical groups, as follows:—
1. Chronic cyclitis or so-called "iritis serosa" distinguished only by precipitates upon the back of the cornea. The condition may exist for years without serious disturbance of sight, although in many instances vision is eventually damaged by vitreous opacities or by rise in tension. 2. Cases of irido-cyclitis where, in addition to precipitates, synechiæ and their results are present. Blindness may ensue. The eye may often be saved by the performance of a timely iridectomy. 3. This group may lead to atrophy of the eye. Some of the cases commence with slight symptoms, but others are grave from the outset.

Cases intermediate between the mildest and the most severe of the foregoing groups are not unknown.

Fuchs makes the following provisional anatomical classification of cases, and surmises that the different groups, as arranged by him, may conceivably correspond to different causes:

1. Cases of "iritis" or "irido-choroiditis" where the ciliary body is unaffected. The changes in the iris include slight infiltration with lymphocytes and plasma cells, the latter often in preponderating numbers. Polymorphonuclear leucocytes, on the contrary, are absent. At a later stage the infiltration may be replaced by slight atrophy of the tissues of the iris. Exudation is trivial, and confined to the neighbourhood of the pupillary edge of the iris. There may be posterior synechiæ and a fine membrane in the pupil. These cases, as a rule, pursue a mild course clinically, and Fuchs thinks that they may be caused by toxins suspended in the aqueous humour.

2. "Irido-cyclitis" where the changes affect both the iris and the ciliary body. The alterations in the iris resemble those described above. There are also typical changes in the ciliary body. At first, an exudation of lymphocytes occurs upon the surface of the ciliary body, and the lymphocytes find

their way into the anterior chamber, and, when they are precipitated against the posterior surface of the cornea, form one but not the only source of keratitis punctata. In the latter stages there is an overgrowth of the epithelium of the ciliary body, especially of the pars non-plicata and of the posterior portion of the corona ciliaris. This epithelial hyperplasia is typical of some cases of chronic uveitis, inasmuch as Fuchs has found a similar pathological condition in no other disease. The cases belonging to this group, like those of group 1, may be caused by toxic action.

3. The cases of this group, which are characterised by "*Schwarten*" in the interior of the eye, may lead to total detachment of the retina and to atrophy of the eyeball. They may or may not betray their severe nature from the first. They resemble endophthalmitis following exogenous infection. They must be distinguished from the first two groups, not only by their severity, but also by their essential nature. They may be caused, Fuchs thinks, by a specially virulent kind of toxin, and some, perhaps, by bacteria, conveyed to the eye by metastasis.

4. From a pathological point of view, the cases of this group resemble those of sympathetic ophthalmitis, while clinically they appear under the guise of a steadily progressive but chronic cyclitis. Three cases which belong to this group have been investigated by the author.

5. This group, of which Fuchs has had the opportunity of investigating only two examples pathologically, is characterised by a colossal infiltration of the uvea, as well as of the retina, by giant cells. There is extensive necrosis of the membranes in question.

The classification proposed by Fuchs is essentially provisional. Groups four and five are instances of proliferative inflammation, and are to be differentiated from the first three groups. The slighter cases may be due to toxins, whereas some of the more severe ones may be the outcome of parasitic action. SYDNEY STEPHENSON.

X.—TUBERCULOSIS OF THE EYE.

(1) **Stern, Jacob.—Contribution to the knowledge of "weakened tuberculosis" of the conjunctiva. (Beitrag zur Kenntniss der "abgeschwächten Tuberkulose" der Bindehaut [Conjunctivitis Parinaud].)** *Centralbl. f. prak. Augenheilkunde*, November, 1912.

(2) **Morax.—Superficial ulceration of the bulbar conjunctiva revealing a tuberculous septicæmia. Diagnosis by culture. (Ulcération superficielle de la conjonctive bulbaire révélatrice d'une septicémie tuberculeuse. Diagnostic par la culture.)** *Ann. d'Oculistique*, janvier, 1913.

(3) **Verhoeff, F. H.—The experimental production of sclero-keratitis and chronic intra-ocular tuberculosis.** *Archives of Ophthalmology*, September, 1913.

(4) **Dutoit, A.—The ætiology of tuberculosis in ocular pathology. (L'étiologie de la tuberculose dans la pathologie oculaire.)** *La Clinique Ophtalmologique*, 10 octobre, 1913.

(5) **Butler, T. Harrison.—"Struma" as an important factor in diseases of the eyes.** *British Medical Journal*, October 18th, 1913.

(6) **Cobbledick, A. S.**—Struma an important factor in eye disease. *British Medical Journal*, November 22nd, 1913.

(7) **Stephenson, Sydney.**—Tuberculosis of the eye. *Lancet*, November 29th, 1913.

(1) The case of Parinaud's conjunctivitis reported by **Stern**, of Berlin, occurred in a boy, aged 7 years, who also had enlarged glands in the neck and parotid regions. Bits of diseased tissue were excised and implanted into the eyes of rabbits and injected intraperitoneally into guinea-pigs without any positive result, except in two rabbits in which an iridectomy preceded the implantation, in which cases typical tuberculous nodules developed in about a fortnight. The material from these two eyes produced rapid inflammatory change when introduced, without iridectomy, into the eyes of other rabbits, and a generalized tuberculosis when injected into the peritoneal cavity of guinea-pigs.

As regards the patient, the condition slowly got better under local treatment, and then for a while seemed to "hang fire." It was then decided to try the effect of tuberculin injections, under which the condition promptly and effectively cleared up.

Stern comes to the conclusion that Parinaud's conjunctivitis is a low-grade tuberculosis, with the causal organism existing only in very small numbers and in a state of low vitality. The virulence of the organism can be increased by passing it through an animal. A. LEVY.

(2) **Morax**, of Paris, records the case of a man, aged 35 years, who, after an attack of continuous fever, which was suggestive of typhoid, but which was proved not to be that disease by serum diagnosis and hæmo-culture, developed an episcleral nodule on his left eye. This subsequently formed a superficial erosion with none of the characteristics usually associated with tuberculous ulceration of the conjunctiva. Ophthalmoscopic examination excluded the possibility of its being secondary to a cilio-scleral nodule. Cultures of scrapings were made on various media, and, at the end of three months, those on potatoes were found to have given rise to a growth of tubercle bacillus which caused typical lesions on inoculation of a guinea-pig. The patient was seen only once, but on tracing him, it was found that he had died of pulmonary and laryngeal tuberculosis.

The author refers to the theory, recently put forward, that there are strains of the tubercle bacillus which are infectious for man and non-infectious for the guinea-pig, and, without regarding it as proven, considers that his case is strong evidence that valuable information as to whether a lesion is or is not of a tuberculous nature can be sometimes obtained from cultures on artificial media.

He suggests that the isolation of a bacillus of the tubercle type in cultures from phlyctens would do more to settle the vexed question of the nature of the disease than any number of tuberculin injections.

R. J. COULTER.

(3) **Verhoeff**, of Boston, Mass., brings forward the results of five experiments on rabbits' eyes in support of his theory that tuberculous scleritis and keratitis are due to infection of the aqueous humour through the filtration angle.

He injected dead tubercle bacilli into the vitreous or aqueous humour, using dead bacilli in order to avoid active intra-ocular tuberculosis supervening and to approximate the conditions to those in man, where a relative immunity causes mildness of the lesions. In three months, lesions occurred in the rabbits' eyes analogous to those occurring in tuberculous sclero-keratitis in man. The ciliary body was mostly involved along with the sclera, but in some cases there was practically no such involvement. Tubercles also occurred in the retina, iris, and choroid, but those at the filtration angle were larger and more numerous than those elsewhere. When the bacilli were injected into the aqueous humour, the lesions were not exclusively in the lower part of the angle, but were more numerous laterally and in some cases occurred above, as in human cases. There were no discrete lesions in the cornea apart from the limbus, although some occurred on the posterior surface of the cornea. In the iris, the lesions were small and situated both on and within the tissue; the lesions in the ciliary processes were also on and within the epithelium, the bacilli having passed in from the aqueous humour, for all stages of a lesion passing from the surface epithelium to within could be made out. In the choroid, in those cases where injection had been made into the aqueous, extension had evidently taken place through the filtration angle, since the lesions were mostly in the anterior part and the overlying retina was unaffected. Verhoeff thinks that the lesions in the iris, ciliary processes, and choroid in these rabbits' eyes indicate that in man also they may be metastases from the aqueous humour and not necessarily from the blood. He thinks that the bacilli reach the aqueous from the ciliary vessels without, in passing, producing any lesion of the ciliary processes. Such metastases would be favoured by the absence of immune bodies in the aqueous.

The treatment indicated by the above considerations is frequent paracentesis, with the view of bringing immune substances into the aqueous, and local treatment of the sclera and cornea by the knife, cautery, or strong antiseptics. ROSA FORD.

(4) The contribution by **Dutoit**, of Montreux, is in the nature of a review of this subject.

(5) **Butler**, of Leamington, believes that the text-books even of to-day pay too little attention to attenuated tuberculosis ("Struma") as the cause of diseases of the eye. Many ophthalmic surgeons, he thinks, are still content to talk of diatheses and dyscrasias, and to such the word "rheumatic" is a veritable shibboleth.

Discussing the recognition of a tuberculous origin of an affection of the eye, Butler attaches importance to the family history and the clinical appearance of the diseased organ He unconditionally puts on one side the Calmette reaction, on account of the danger to the eye entailed by its use. A negative von Pirquet's reaction would (curious as it seems) be more valuable than a positive. Of the three kinds of reaction that may follow the injection of old tuberculin (focal, local, and general), the first-named is by far the most important in eye work, since it indicates the actual presence of the bacilli in the organ. Butler has so far paid no attention to the local reaction as a sign of tuberculosis. The general reaction, of course, means the existence of a tuberculous focus somewhere in the patient's body. Grave tuberculous lesions are seldom seen in association with ocular tuberculosis, the reason usually assigned being that given by Straub, namely, that the chronic attenuated tuberculosis which causes the secondary disease has immunized the organism to the bacillus.

Phlyctenular ophthalmia is regarded by Butler as the result of a "tuberculo-toxæmia." A tuberculous ætiology was exceedingly probable in 70 per cent. of his cases. He has found that the manifestations disappear, without other treatment, within a couple of days after one injection of T.R. He regards the condition called by Benedict many years ago "photophobia infantum scrofulosa" as pathognomonic of struma, and has obtained positive reactions with tuberculin in such patients. The condition rapidly improves under daily spinal douches with cold water, combined with the good surroundings of a hospital. The *B. tuberculosis* is the prime factor in the causation of cases of scleritis. Butler has so far always obtained a general reaction from the injection of tuberculin in cases of this nature. Tuberculin in scleritis is a double-edged weapon, however, and Butler cites a couple of cases where it appears to have done distinct harm. Some 30 per cent. of the cases of interstitial keratitis are of tuberculous origin. Year by year the author becomes more and more sceptical as to the existence of a "rheumatic" or "gouty" iritis. A proportion of the cases sometimes called "rheumatic" are in reality due to tuberculosis. Most of the others result from gonorrhœa, sepsis, or auto-intoxication. In cyclitis, which is frequently tuberculous in nature, Butler has obtained most encouraging results from tuberculin. In children especially, the lacrymal sac is frequently affected with tuberculosis, and, in the author's opinion, should be extirpated at once.

Butler regards tuberculin as a valuable remedy in the treatment of attenuated tuberculosis, although care is required in its use. If the local focus in the eye forms but a part of a widely-spread tuberculosis, he believes that it is apt to be very harmful, and the same remark is true when a state of anaphylaxis is present. He employs T.R., and begins with 1/2000 mg., repeating the dose once a week. After eight or ten injections, he usually increases the dose to 1/1000 mg., and occasionally to 1/500 mg. It is necessary to exercise patience, since sometimes no improvement is manifest for weeks or even months. SYDNEY STEPHENSON.

(6) Discussing Butler's communication, abstracted above, **Cobbledick,** of London, is convinced that adenoids are always present in cases of phlyctenular ophthalmia. The result of promptly removing adenoids and, if necessary, the tonsils also, is claimed by Cobbledick to be "magical." Further, any tendency to recurrence is said to disappear after the operation. A similar line of treatment succeeds in cases of photophobia in children without serious corneal lesion. SYDNEY STEPHENSON.

(7) **Stephenson**, of London, condenses our knowledge of the ætiology and diagnosis of ocular tuberculosis. The question of treatment is hardly touched upon.

The author first traces the increasing importance of the *rôle* played by tubercle in eye diseases from the discovery by Villemin, in 1865, that tubercle could be inoculated into rabbits, and by Langhans, in 1867, that the conjunctiva of those animals could be infected, up to his own work in 1896, and later. With regard to interstitial keratitis in particular, it is pointed out that Mackenzie, in 1830, described it as "scrofulous keratitis," a hint of the tuberculous ætiology of a proportion of cases now so recognised which was completely put in the background by Hutchinson in 1863. Stephenson himself showed, in 1908, that out of 100 cases of interstitial keratitis, 9·9 per cent. were tuberculous. Again, conditions which we should now regard as tuberculosis of the iris were described by Lawrence in 1833, and by Mackenzie in 1854. In 1890 v. Michel maintained that tuberculous iritis was nearly as common as that due to syphilis. Stock, in 1907, by the injection of pure cultures into the auricular vein of the rabbit, was able to produce inflammation of the iris and ciliary body. It is noteworthy that these experimental inflammations in many instances did not conform with those generally regarded as characteristic of tubercle, either in their naked-eye appearance or histological structure. Nevertheless, tubercle bacilli could be found in them.

That tubercles might form in the choroid has been known since de Mussy discovered them *post-mortem* in 1837. They were recognised by Jaeger with the ophthalmoscope so early in ophthalmoscopic days as 1855. Manz examined them with the microscope in 1858.

We come next to the author's description of chronic tubercle of the choroid in 1896. Some few years after this, he and the late George Carpenter again described these deposits as "obsolescent tubercle," and, further, with regard to acute miliary tubercle of the choroid, estimated that this occurred in at least 50 per cent. of cases of tuberculous meningitis. This high percentage has been increased by Marple in his cases to 100 per cent.

Even the sclera may suffer from secondary tuberculosis, despite the dictum of Calderaro, that this form is always a primary exogenous affection. Hancock and Mayou consider that many cases of tuberculous scleritis masquerade as episcleritis. In short, every part of the eye, except the lens, may be infected with tubercle, and although this disease of the eye is not absolutely common, still it is relatively so. Thus, T. H. Butler found eight cases of obsolescent tubercle of the choroid in 5,000 eye cases.

The bacilli may be human or bovine and may infect either exogenously or endogenously. As a rule, infections of the conjunctiva or lacrymal sac are exogenous, while those of the interior of the eye are endogenous. These facts are of importance, for while a tuberculous sac may be excised with good hope of extirpating the disease, excision of an eye with tubercle of iris or choroid (endogenous infection) is likely to be of little use. Even if called for on surgical grounds, Rogman and others have drawn attention to the danger of the operation.

The author next turns to methods of diagnosis. The various ways in which the actual bacillus may be looked for and variations in histological structure are described. He speaks especially of the method first employed by Gourfein and then by himself, which consists in drawing off the aqueous and examining for bacilli, in cases of supposed tubercle of the deeper parts of the eye. Lastly, the von Pirquet skin reaction and the Koch subcutaneous test are referred to. The advantages of the von Pirquet method are that it is safe and easily performed, for example in out-patients. On the other hand, the test is so sensitive, and tubercle past or present is so common, that, except in young children, the positive reaction is not of much diagnostic use. The negative reaction is of greater value. An eye disease suspected to be tuberculous is certainly due to something else if the patient fails to react to the careful use of tuberculin. Another drawback to this test is that there is no local eye reaction. The Koch subcutaneous test, on the other hand, gives, in addition to a general reaction, a focal reaction. This is most useful provided it does not exceed certain limits. The great advantage of the Koch method may be more than counterbalanced by the fact that on occasion the focal reaction may exceed the limits either desired or expected. Various instances of this are quoted from the writings of others, not only with regard to the diagnostic test, but also with regard to tuberculin treatment.

Stephenson concludes an excellent article by paying a well-deserved tribute to A. von Hippel for his persistent advocacy of tuberculin treatment at a time (1904) when the method lay under a cloud. ERNEST THOMSON.

XI.—CYSTICERCUS.

(1) **Cirincione.—Early changes occasioned by the invasion of the eye by the cysticercus.** *Archives of Ophthalmology*, March, 1911.

(2) **Balbuena, Fernandez.—A subretinal cysticercus. (Cisticerco subretiniano.)** *Archiv. de Oftal. Hisp.-Amer.*, May, 1911.

(3) **Elliot, R. H. and Ingram, A. C.—A case of sub-conjunctival cysticercus cellulosæ.** *Indian Medical Gazette*, Vol. XLVI, p. 216, June, 1911.

(4) **Wittich, W.—A contribution to the pathological anatomy of intraocular cysticercus. (Ein Beitrag zur pathologischen Anatomie des intra-okularen Zystizerkus.)** *Klin. Monatsbl. f. Augenheilkunde*, November, 1912.

(5) **Dupuy-Dutemps.—Sub-retinal cysticercus. Extraction. (Cysticerque sous-rétinien. Extraction.)** *Fondation Ophtalmologique Adolphe de Rothschild*: *Bulletin et Travaux*, 1911, p. 1. (Received May, 1913.)

(1) **Cirincione**, of Palermo, sums up his results fully as follows: 1. "Cysticercus in the vitreous produces an irritating effect upon the retina and optic nerve, and gives rise to the formation of a preretinal cellular membrane, which is firmly attached to the retina at only a few points; upon this membrane and the small-celled infiltration depend the cloudy appearance of the retina and disc. 2. The contraction of the preretinal membrane causes a contraction of the inner layers of the retina, and a throwing into folds of the three outer layers, and this causes the wavy appearance of the fundus, and starts the retinal detachment. 3. Cysticercus of the vitreous can be located beneath the hyaloid membrane, in which case there exists, between it and the parasite, a space, which is filled in by that lemon-yellow fluid which flows out during extraction of the cysticercus, and which, when the parasite makes an opening through the retina, as a result of movements of its neck, may flow into the subretinal space, and give rise to an extensive detachment of the retina. 4. The small spots which lie in front of the cysticercus (prevesicular spots) depend upon the presence of subhyaloid cell-nests, and the iridescence of the margin of the vesicle is an optical phenomenon. 5. The white retinal patch at the point where the cysticercus forced its way into the vitreous is composed of compact cicatricial tissue, which causes a firm adhesion between the choroid and the remains of the retina, which is here represented by a few Müller's fibres. 6. In the region where the parasite is attached to the retina, the latter is transformed into a connective-tissue membrane, and the cysticercus does not lie in direct contact with it, but through the intermediation of a more or less compact layer of cells and coagulated hyaline substance. Beyond the cysticercus, the retina rapidly takes on its normal layers again. 7. Numerous multi-nuclear bodies are observed on the surface of the preretinal membrane, near and underneath the vesicle. These are pseudo-giant-cells, which result from hyaline masses in which nuclei have become entangled, and which take on the form of giant-cells, probably as the result of the undulatory movements of the vesicle. 8. The extensive changes found in eyes enucleated late on account of cysticercus are the result of proliferation and change of the choroid, produced by the cysticercus, which acts like an aseptic foreign body, and not upon its irritative action, which does not affect the choroid. 9. The extraction of the cysticercus from the vitreous is favourable only when the prevesicular spots are seen, in which

case we must be careful to reach the subhyaloid space without opening the hyaloid membrane."

The irritative effects are produced by an irritating substance dissolved in the vitreous, which is produced as an excretory product of the cysticercus.

ROSA FORD.

(2) **Balbuena** gives an account of a case of this affection, in which he had the opportunity of observing the parasite escape from under the retina into the vitreous.

HAROLD GRIMSDALE.

(3) This case by **Elliot** and **Ingram**, of Madras, is the first instance of ocular cysticercus cellulosæ reported from India. It was in a French Eurasian male, of 24 years. It formed a cyst, 2/5-inch long, in the lower ocular conjunctiva. An examination of the contained embryo showed that it was one of tænia solium. Two years before, the conjunctiva had been wounded in this situation by a piece of a broken glass tumbler. A year earlier still the patient had had a servant who frequently passed fragments of tape-worm. The interval, however, appears too great for this to have been the source of the malady. The patient had noticed the cyst growing for six months. There were no similar cysts found elsewhere on examination, and treatment with male fern and castor oil failed to show proglottides.

H. HERBERT.

(4) The case by **Wittich**, of Jena, is briefly as follows.—A man of 25 years, had been aware of dimness of vision in his right eye for three years. Externally, the eye presented no abnormality. There were floating opacities in the vitreous. There was a large choroiditic patch in the lower part of the fundus, suggesting by its appearance the presence of a yellowish mass beneath the retina. About the equatorial zone below this gave place to a greyish-green cystic-looking mass, which projected into the vitreous. The Sachs' lamp gave no shadow. The eye was enucleated, and, on opening it, a cysticercus cyst, nine millimetres in diameter, was seen at the equator below.

The paper gives full details of the microscopic examination of the parasite itself, and of the changes in the surrounding retina and choroid. The author reaches the conclusion that the parasite was situated *in* the retina, and not underneath it, as is usually the case, and that it must have reached the eye through the central retinal artery, not through the vessels of the choroid. In addition to this peculiarity, he draws attention to the unusual absence of severe changes in the eye, such as detachment of the retina and uveitis, and to the absence of giant-cells from the part of the cyst wall belonging to the host.

A. J. BALLANTYNE.

(5) The case of subretinal cysticercus which is reported by **Dupuy-Dutemps**, of Paris, occurred in a man aged 35 years, in whom vision had been failing for two months. Between the disc and the macula, there was a round, sharply-defined detachment, two disc-breadths in diameter, and about 1 mm. in height. A whiter area, in which the head and neck of the scolex could sometimes be distinguished, was visible in the centre. Under observation, movements of the head were seen, and the cyst, as a whole, migrated to a small extent under the retina. Vision, 1/50. No evidence of cysticercus elsewhere could be obtained, and no information as to the source of infection elicited. The patient himself did not harbour a tape-worm.

After carefully calculating the situation of the parasite, the external rectus was divided, and the globe rotated strongly inwards. It was impossible to bring the optic nerve into view, but its position having been ascertained by touch, an incision, 7 mm. long, was made through the sclera. The parasite did not present, nor could it be made to do so by a suction apparatus. Forceps also failed to grasp it, and as vitreous began to escape, the operation was abandoned.

A month and a half later, the detachment had increased, and many hæmorrhages and white spots were visible in the retina. Vision had sunk considerably. The parasite was still visible at the external border of the detachment. In view of the more peripheral situation of the cyst, it was felt that the prospects of a successful operation were now improved, but before undertaking it, an attempt at a more precise localisation was made. The patient was placed at the perimeter with both eyes open, and told to look at the fixation point with his good eye. With the ophthalmoscope before his eye the surgeon then moved along the perimeter arc until the cyst became visible. From the data so obtained it was easy to calculate the approximate position of the parasite. In order to find this point easily during the operation, the proper meridian was marked by the insertion of a black thread at the limbus, and a piece of silver wire of exactly the proper length was prepared, so that it could be laid on the surface of the globe in that meridian. These measures were completely successful. The external rectus having been again divided, and a scleral incision made, the cyst presented at once, and was removed without loss of vitreous. The eye soon became quiet, but vision did not improve.

Dupuy-Dutemps discusses the reasons which led him to reject other methods of treatment. Electrolysis has been followed by severe iridocyclitis. Sublimate and formol injections, which have been practised in hydatids of the liver, are not permissible in the eye. Concentrated sunlight was considered too dangerous in view of the close proximity of the nerve. Male fern was tried in large doses, but without any effect on the vitality of the parasite.

George Coats.

XII.—OPHTHALMOLOGY AND GENERAL MEDICINE.

(*First Notice.*)

(1) **Keiper, George F.—A case of amblyopia due to the ingestion of one hundred and twenty grains of quinine sulphate.** *Ophthalmic Record*, October, 1911.

(2) **Tyson, Henry.—Amblyopia from inhalation of methyl alcohol.** *Archives of Ophthalmology*, September, 1912.

(3) **Dufour, M.—On scintillating scotomata. (Ueber das Flimmerskotom.)** *Bericht der Ophthalmologischen Gesellschaft*, Heidelberg, 1912.

(4) **Deutschmann, R.—Ophthalmoplegia interna in children. (Ueber Ophthalmoplegia interna im Kindesalter.)** Deutschmann's *Beiträge zur Augenheilkunde*, Heft lxxxi, 1912.

(5) **Worthington, Major H.—Report of a case of mumps with interesting ocular complications.** *Ophthalmology*, April, 1913.

(6) **Goeppert, F.—The pathogenesis and therapy of facial eczema in children (from the standpoint of the pediatrist).** *Archives of Ophthalmology*, May, 1913.

(7) **Yamaguchi, H.—Xanthopsia produced by santonin. (Xanthopsie bei Santoninmissbrauch.)** *Klin. Monatsbl. f. Augenheilkunde*, Juli, 1913.

(8) **Rochester, Alexander.—An early sign of paresis of the facial nerve.** *Ophthalmic Record*, August, 1913.

(9) **Frenkel, Henri.—The relations between the familial affections of of the optic nerve and those of the nervous system. (Sur les relations des affections familiales du nerf optique avec celles du système nerveux.)** *Centralbl. f. prak. Augenheilkunde*, August-September, 1913.

(10) **Meller, J.—Choked disc and abducens paralysis in chlorosis. (Ueber Stauungspapille und Abduzenslähmung bei Chlorose.)** *Centralbl. f. prak. Augenheilkunde*, August-September, 1913.

(11) **Dykes, A. L.—Eye colouration in relation to the incidence, severity, and fatality of scarlet fever and diphtheria.** *Lancet*, November 29th, 1913.

(1) The case by **Keiper**, of Lafayette, was that of a man, aged 75 years, who became totally blind after taking a good deal of whisky, followed by 120 grains of sulphate of quinine. Eight days later, his vision was 20/200, pupils were moderately large and immobile, and colour sense was fairly good to red, blue, rose, and green. Fields contracted to about half normal size; no scotomata. Ophthalmoscopically, the discs were seen to be pale, vessels contracted, and macular regions quite pale; a spot of retinitis below disc on left side. After about six months treatment with aperients, diuretics, strychnine, and capsicum, his vision, with correction, was R.=20/30 and J.2, L.=20/40 and J.2. J. JAMESON EVANS.

(2) **Tyson**, of New York, adds three more cases of methyl alcohol amblyopia to the thirteen already reported in the literature.

The first was that of a man of 21, who had worked for two days shellacking the interior of a large beer vat. On the third day, symptoms of poisoning occurred, and he was unable to work. On the fifth day, vision commenced to fail, and five days later, he was seen by Tyson and admitted to hospital. There optic neuritis was found with central absolute scotoma and contraction of the fields for white. Shortly afterwards, both the scotomata and the contraction of the fields had cleared up, but they returned later. The red and green fields were markedly contracted, and there was pallor of the discs. In the portions of the fields for white remaining, there were scattered scotomata. The fields for white progressively decreased, and, finally, a tubular field became indicated. Hearing was also somewhat affected, and Tyson suggests that the functions of other cranial nerves should be investigated in cases of methyl alcohol poisoning. Two of this man's fellow workmen, who had laboured a day longer than he, died, the one two days after ceasing work, the other three days. The contraction of the fields and the scattered scotomata are accounted for by the fact that methyl alcohol acts, not only on the papillo-macular bundle of fibres, as in pure retrobulbar neuritis, but also on the ganglion cells of the retina, and that in one case hyperæmia of the disc was present and in another (the first mentioned) optic neuritis. The other two cases were in young women working in the same room at polishing lead pencils, employing varnish made from wood alcohol. Both had scotomata, contracted fields, and diminished acuity of vision. Their subjective symptoms were always worse on cold damp days on which the windows were shut. With treatment the general health improved, but not the vision.

Tyson concludes that: (1) methyl alcohol is a subtle poison and should be recognised as such by law; (2) it may be inhaled in sufficient quantities during the hours of labour to produce amblyopia, blindness, or death; and (3) where methyl alcohol is used in the trades and arts, notices of its toxicity should be posted about the premises, and an abundance of ventilation should be obligatory. The use of denatured alcohol as a substitute for methyl alcohol should be enforced. ROSA FORD.

(3) **Dufour**, of Nancy, who himself suffers from scintillating scotomata, described to the Congress his own sensations. He believes that they have their seat in the retinocephalic neurones. T. HARRISON BUTLER

(4) The form of ophthalmologia interna referred to in this paper by **Deutschmann**, of Hamburg, is that to which he called attention at the Heidelberg Congress in 1905.

He now gives particulars of fourteen cases, from which it appears that the condition originates in childhood; that it has been, in all cases except one, associated with parenchymatous keratitis, which was probably due to hereditary syphilis; and that in the one exceptional case a positive Wassermann reaction was obtained. The pupil in these cases gives absolutely no reaction in near vision or on illumination, but it contracts well on application of eserine. Accommodation is not always involved, or may be less so than the iris. Deutschmann believes that the keratitis and ophthalmoplegia interna is a combination of symptoms traceable to hereditary syphilis. As regards the site of the lesion which is responsible for the ophthalmoplegia, he excludes atrophic and degenerative changes in the iris and affections of the ciliary ganglion, and concludes that we must assume a nuclear lesion. The theory invoked to explain the paralysis of the sphincter is that the damaged nucleus is able under ordinary circumstances to keep up the innervation of the sphincter, but that, after the pupil has dilated, as the result of application of atropine, or on account of corneal opacity so dense as to prevent access of light to the retina, the weakened nucleus never again succeeds in innervating the muscle.

Sufficient particulars are not given to justify the relegation of these cases to a special class, nor is the explanation at all convincing.

A. J. BALLANTYNE.

(5) The complications of mumps hitherto reported include neuro-retinitis, retrobulbar neuritis, optic atrophy, keratitis, iritis, dacryoadenitis, paralysis of accommodation, and paralysis of extra-ocular muscles. In this case by **Major Worthington**, of Chicago, keratitis came on at the beginning of convalescence from acute parotitis complicated with orchitis in a man aged 23. Vision fell to "fingers" at ten feet. Seven days later, after treatment with atropine, dionine, and hot applications, the eye was well and vision 20/20. There was no recurrence. A. J. BALLANTYNE.

(6) **Goeppert**, of Göttingen, believes that the facial eczema, which is so often associated with eye affections, is dependent upon a congenital diathesis, sometimes aggravated by errors in diet. It is met by correction of these errors and by general treatment of the diathesis. ROSA FORD.

(7) **Yamaguchi**, of Tokio, records a case of unusually persistent xanthopsia after the use of santonin. The patient, a man of 38 years, received altogether 0·5 grammes of santonin in the course of two days. For thirty-seven days yellow vision persisted in a large central area of the field of vision of the right eye. A. J. BALLANTYNE.

(8) **Rochester**, of Chicago, finds that the following sign can generally be elicited before any other in cases of paresis of the seventh nerve, *e.g.*, after mastoid operations.—"The patient is told to close lightly both eyes, but not to squeeze them together as in the usual test. The observer then, grasping the patient's hand, holds it directly in front of his face, and instructs the patient to

look exactly in the direction of the hand, while, however, he keeps the eyelids lightly closed. The hand is then gradually raised until it is beyond the upper border of the field of fixation. Now, at this time, if there be a paresis of the facial nerve, it will be observed that the lid on the affected side will be held close with much more difficulty than its fellow; indeed, that the upper lid margin will rise slightly away from the lower one, disclosing a narrow band of sclera. If the irritation of the nerve be only of the very slightest, the eye may be closed, but the test is shown positive by the increased agitation and quivering undergone by the lid in its effort to retain the closed position."

J. JAMESON EVANS.

(9) The communication of **Frenkel**, of Toulouse, is one worthy of very special study by neurologists and ophthalmologists interested in neurology. It is so precise and depends for its argument upon so many case-histories that it is impossible to summarise it. Frenkel's conclusions only can be given here:—

1. Just as there are many types of familial affections of the nervous system, so there are many types of familial optic atrophy; some hereditary and familial, others familial but limited to one single generation. It is these latter cases, presenting the appearance of simple atrophies (not neuritic), which appear to have a tendency to be associated in the same individuals with familial affections of the nervous system. There is one case alone of Freidreich's disease associated with optic atrophy, and one case only of Leber's atrophy associated with a familial affection of the nervous system, and this was limited to one generation.

2. Those organic affections of the nervous system which, in sporadic cases, are rarely associated with optic atrophy (cerebral diplegia, Freidreich's disease), are, on the contrary, when they occur as hereditary, or rather familial, affections, frequently associated with optic atrophy in several members of the same family. On the other hand, among the numerous affections which, in sporadic cases, are frequently accompanied by optic atrophy (tabes, disseminated sclerosis), one does not find many instances of the coincidence of several cases of both conditions among several members of the same family. If this observation be correct, it would be an argument in favour of a very special nosological and pathological condition existing in this group of cases.

3. The familial and non-hereditary diseases of the optic nerves frequently commence in infancy (Tay-Sachs' disease, pigmentary retinitis, simple atrophy), and the gravity of these cases with early onset may be the reason why they are not seen in several generations.

The familial and hereditary diseases of the optic nerve (Leber's atrophy) show themselves in youth or adult age, and are of a much more benign nature. As a matter of fact, from the point of view of prognosis as regards vision, the familial affections which commence in early infancy are much more serious than those which appear later. The latter do improve, and sometimes indeed recover completely.

4. Consanguinity appears to play an important part in the ætiology in those families in which cerebro-spinal affections are associated with affections of the optic nerves. Out of eleven families quoted, six presented this ætiological factor.

5. Infection or inflammation appears to be of no ætiological importance in the group of cases. The term "familial degeneration" is entirely applicable to this syndrome.

6. As in Tay-Sachs' disease, familial degeneration affects both the central and peripheral neurones, and it seems likely that the atrophy of the optic

nerves in the cases under discussion begins as a lesion of the cellular elements of the retina.
A. LEVY.

(10) The occurrence of choked disc in chlorosis and probably also in some of the other anæmias, has been known for a long time (Hirschberg, 1877) and many explanations have been advanced.

Meller, of Vienna, reports several cases, and accepts as the most likely the explanation advanced by C. Hawthorne, of London, namely, a thrombosis in the region of the cavernous sinus.

The presence of a choked disc leads naturally to the suspicion of intra-cranial tumour, and this suspicion may be further strengthened by the occurrence of other symptoms associated with brain tumour, *e.g.* :—headache, dizziness, and vomiting, and more than these, the occurrence of unilateral, or even bilateral, ocular paralysis. This symptom-complex of choked disc and abducens paralysis in chlorosis is peculiar, inasmuch as no other eye muscle is affected in this condition, and therefore, one must think of a common cause, the most likely being thrombosis in the cavernous sinus. The choked disc seen in these cases, great distension of the veins, and blurring of the edge, with comparatively little swelling, would be in favour of this explanation.

It is well-known that chlorosis is one of the diseases with a tendency towards thrombosis, and that cerebral sinus thrombosis can cause choked disc is also well-known. Intracranial thrombosis, according to its extent and rapidity of onset, may cause very varying symptoms, from none at all to a rapidly fatal result. The occurrence of choked disc in the analogous cases of thrombosis from middle-ear disease, and after the loss of a great quantity of blood, is corroborative evidence.

It is very important to recognise these cases of chlorosis early, for proper treatment almost invariably leads to a complete cure, while, should the diagnosis of cerebral tumour be made, and a course of mercury and iodide prescribed, much harm may be done, even to the total extinction of vision.
A. LEVY.

(11) **Dykes**, of Oldham, has investigated the question of the relative incidence, etc., of scarlet fever and diphtheria in different types of ocular pigmentation. He adopts the nomenclature of Hurst. Eyes which have in the iris no visible stroma pigment are classed as "simplex," those which have stroma pigment, in addition to retinal pigment, are called "duplex." The latter class is subdivided into "duplex medium" and "duplex dark." In the first place, in order to determine the normal proportion in the district, 1163 school children were examined ; 29·8 per cent. had simplex eyes, 35·9 per cent. duplex medium, and 34·3 per cent. duplex dark. Next, in 679 cases of scarlet fever 32·3 per cent. had simplex eyes, 38·4 duplex medium, and 29·3 duplex dark. Those who suffered from the disease *severely* were, simplex 21·0 per cent., duplex medium 15·7 per cent., duplex dark 15·5 per cent. The fatality percentage was 7, 5, and 3 respectively. It would appear, says the author, that scarlet fever is more frequently severe, and has the highest mortality, in simplex-eyed children. The results were more decided in diphtheria, simplex-eyed children being more definitely in excess as compared with the general population, while the darker the type the less was the proportion. For the three types the incidence was 38·1 per cent., 32·6 per cent. and 29·3 per cent. respectively, while the percentage fatality was 10·2 per cent., 4·7 per cent. and 2·6 per cent. respectively. ERNEST THOMSON.

XIII.—REMEDIES.

(*Fourth Notice.*)

(1) Wibo.—Carbonic cauterisation in the treatment of granular ophthalmia. (La cautérisation carbonique dans le traitement de l'ophtalmie granuleuse.) *Ann. d'Oculistique*, mars, 1913.

(2) van Lint.—Neuroparalytic keratitis following an injection of alcohol into the superior maxillary nerve for facial neuralgia. (Kératite neuroparalytique à la suite d'une injection d'alcool dans le nerf maxillaire supérieur pour névralgie faciale.) *Ann. d'Oculistique*, mars, 1913.

(3) Jacqueau.—Tincture of iodine in ophthalmology. (La teinture d'iode en ophtalmologie.) *Lyon Médical*, 27 avril, 1913, p. 937.

(4) Wessely.—Further experience in the treatment of serpent ulcer with the steam cautery, and of dacryocystitis with tincture of iodine injections. (Weitere Erfahrungen in der Behandlung des Ulcus serpens mit dem Dampfkauter und der Dakryocystitis mit Jodtinkturinjektionen.) *Bericht der Ophthalmologischen Gesellschaft*, Heidelberg, 1913.

(5) Vittorio Ruata.—Iodosan: a new iodine preparation: its application in ocular therapeutics. (Ricerche cliniche e sperimentali sopra un nuovo preparato iodico, iodosan, e sua applicazione in terapia oculare.) *Archivio di Ottalmologia*, November, 1913.

(6) Bernheimer, St.—The tuberculin treatment of eye diseases. (Zur Tuberkulinbehandlung Augenkranker.) *Klin. Monatsbl. f. Augenheilkunde*, Oktober-November, 1913.

(7) Streiff, J.—The etiology of rheumatic eye diseases, and the treatment of ocular inflammations due to "secondary tuberculosis." (Zur Aetiologie rheumatischer Augenerkrankungen und zur Behandlung von Augenentzündungen auf "sekundär tuberkulöser" Basis.) *Klin. Monatsbl. f. Augenheilkunde*, Oktober-November, 1913.

(8) Darier, A.—A salt of quinine bacteriotropic for the Pneumococcus (ethylhydrocuprëine) as a remedy in infective ulcer of the cornea. (Un sel de quinine bactériotrope du pneumocoque (ethylhydrocuprëine) contre l'ulcère infectieux de la cornée.) *La Clinique Ophtalmologique*, 10 janvier, 1914.

(9) Allan, John.—The value of aspirin in ophthalmic work. *Med. Press and Circular*, 18th February, 1914.

(10) Owen, D. C. Lloyd.—Recent advances in therapeutics in their application to diseases of the eye. *Birmingham Medical Review*, February, 1914.

(11) Reeder, D. F.—Ocular and other complications of syphilis treated by salvarsan. *Medical Press and Circular*, March 4th, 1914.

(1) **Wibo**, of Brussels, considers that applications of carbonic acid snow are destined to take a preponderating place in the treatment of trachoma. He gives notes of seven cases in which he obtained satisfactory results by the method

and refers to five others which promised well but which were too recent for publication when this article was written. After cocaining the eye, he applies a pencil of snow to the diseased areas on the everted conjunctiva for from 15 to 20 seconds, according to the severity of the lesions. R. J. COULTER.

(2) **van Lint,** of Brussels, finds that the pain of essential facial neuralgia is relieved for periods varying from four months to two and a half years (average one year) by injections of alcohol into the trunk of the branch of the trigeminal nerve which is affected. As a rule, the complications of the operation are negligible, but three cases have been recorded in which it was followed by purulent conjunctivitis, benign keratitis, and ill-defined ocular troubles, which left only a little vision respectively.

The author records the case of a woman who suffered from severe facial neuralgia alternating between the superior and inferior maxillary nerves. In spite of extraction of the infra-orbital nerve and avulsion of the infra-maxillary nerve at its exit from the cranium, the pains persisted for six years, when an injection of alcohol was made into the infra-maxillary nerve in the foramen ovale. This was accompanied by no complications and gave relief for a year, when the pain returned and a fresh injection was given, which again relieved the pain but caused paralysis of the external rectus and neuro-paralytic keratitis in the right eye. A median tarsorrhaphy was performed and the inflammation subsided, leaving loss of corneal sensibility, slight corneal opacity, some posterior synechiæ, a patch of exudation on the anterior lens capsule, and vision reduced to 1/3. Eight months after the second injection, the pains returned, and a third injection was given, which again gave relief and caused no complications except diplopia, which lasted only twenty-four hours. van Lint concludes that injections of alcohol which can give excellent results in facial neuralgia, even after extensive nervous resections have failed, may cause neuro-paralytic keratitis, but that a subsequent injection may be made without danger at the same spot as the one which caused the keratitis.

R. J. COULTER.

(3) **Jacqueau,** of Lyons, has a very practical article upon the employment of iodine as a local agent in eye work.

After many experiments, he has reached the conclusion that it is useless to attempt to combine iodine with an anæsthetic substance, and that the watery solution of iodine, which would seem likely to be less irritating to the eye since it contains no alcohol, presents no outstanding advantage over the tincture of iodine of the Codex. He employs ordinary tincture of iodine, to which is added potassium iodide in the proportion of 0 gr. 75 of the salt to 20 gr. of the liquid. This addition is said to improve the keeping powers of the solution and to render it easier to dilute with water when required.*

Tincture of iodine used as a collyrium for the eye cannot be recommended. In cases of conjunctivitis, even in weak solution (less than 1 in 50), it presents no advantages over the lotions in common use. The remedy, in general, is best applied directly to the lesion, after the previous use of cocaine. If the latter step be omitted, the iodine vapour is apt to prove very irritating to the conjunctiva.

In affections of the eyelids—for example, in long-standing blepharitis, with crusts and ulcerations – a little iodine painted along the roots of the eyelashes on several occasions yielded results even better than those obtained with the familiar "yellow ointment." The remedy is extremely useful when painted over a traumatic ulcer of the cornea, and used in that way may prevent or put a stop to infection and all its evil consequences. Jacqueau urges this plan of treatment upon the attention of the general practitioner of medicine, under whose notice these cases usually fall in the first instance. The *technique* is simplicity itself.—First, the eye is anæsthetised by means of cocaine, 1 in 20 or 1 in 30. Then, by means of a bit of cotton wool twisted around the sharpened end of a wooden match, the infective focus is touched once or oftener, according to the degree of infection present. No instruments beyond the sharpened match are necessary. The application may be repeated daily or even twice in the same day if necessary.

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* Courtot (*Gaz. des Hôpitaux*, 1914, No. 13, p. 205) found that the addition of potassium iodide to tincture of iodine in the proportion of 25 per cent., rendered the latter practically unalterable.—S. S.

It is particularly in operative work that iodine has given Jacqueau the greatest satisfaction. He believes that most of the infections that may follow the extraction of cataract can be avoided by the use of iodine before and during the operation. Besides the usual antiseptic precautions, the edges of both eyelids are carefully painted with iodine the night before the intervention, and in case of need, for several days before operation. The application is repeated when the patient is on the table.* When the corneal flap has been replaced and the operation is finished, a little iodine is applied to the line of incision by means of the appliance described above. Lastly, the usual dressings are applied. This plan has so far been adopted by Jacqueau in thirty-seven cases of cataract. Wounds treated in that way appeared to heal better than under the old conditions. SYDNEY STEPHENSON.

(4) **Wessely**, of Würzburg, communicated to the Heidelberg Congress the results of his treatment of corneal ulcers with the steam and hot alcohol vapour cautery. He included only cases of severe hypopyon-ulcer; the more benign cases he is accustomed to treat in the orthodox manner with bandage and perhaps superficial cauterization with the galvano-cautery. He includes 79 cases in his statistics and compares them with 91 cases treated with the actual cautery. He finds that 50 per cent. of the ulcers treated with the galvano-cautery did more or less badly, whereas only 25 per cent. of the steam-treated cases could be placed in the same category. He states that he expects to save 25 per cent. more eyes affected with hypopyon-ulcer by the use of his steam cautery than he could with the actual cautery. Unfortunately, he says nothing about the results which follow corneal section, and how they compare with those obtained by his new method of treatment.

Wessely then went on to describe a new treatment for suppuration in the lacrymal sac, which consisted in washing out the sac and then injecting a little tincture of iodine with a platino-iridium needle furnished with a rubber cap, which allows the correct amount to be introduced and no more. The abstract of the address does not specify the exact amount. The author has obtained surprising success by this treatment, but says that time will be necessary to determine whether the improvement is permanent. It is necessary to use cotton wool pledgets to absorb any excess of the tincture and keep it out of the conjunctival sac. T. HARRISON BUTLER.

(5) Iodosan is a special solution of iodine, not precipitated by water, but giving out iodine in the atomic state when diluted with tap water. Since the activity of elements is the greater the more minute their division, this, which is the greatest possible division of iodine, explains its activity. It is easy to verify the statement that the iodine is given off in the atomic state, because the coloration of a solution of iodine varies with its condition, whether molecular, in which case the colour is brown, or atomic, as in the case of the violet

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* The reviewer has adopted a similar plan for several years. He also disinfects the skin of the eyelids and side of the nose with iodine immediately before the operation.

solution made by chloroform. Iodosan is a liquid of intense red-brown colour. When it is diluted with a considerable quantity of water, the mixture assumes the characteristic red-violet colour, due apparently to the passage of the iodine into the atomic from the molecular state.

By experiments, **Ruata** has shown that the reaction is less after the application of iodosan than after tincture of iodine, but that the iodosan is more rapidly absorbed, and penetrates much more rapidly into the anterior chamber. Clinically, he has found iodosan of great value in the treatment of blepharitis, hypopyon-ulcer, and acute dacryocystitis; wherever, in fact, a powerful and rapid intervention was required to combat the attack of bacteria which had invaded the tissues. HAROLD GRIMSDALE.

(6) In spite of the excessive enthusiasm and reactionary scepticism with regard to tuberculin, **Bernheimer**, of Innsbruck, is convinced, by the work of v. Hippel and by his own observations, that tuberculosis of the eye is favourably influenced by tuberculin treatment properly employed.

His work on this subject has dealt chiefly with eye conditions occurring in tuberculous persons, such as scrofulous conjunctivitis and keratitis, phlyctenular conditions, etc. One practical point of some importance is that where suppurating glands are present these must first be treated by evacuation, or other appropriate procedure, before commencing tuberculin treatment. He has found that many cases of chronic uveitis with precipitates, in which there is no evidence of syphilis, give a reaction with old tuberculin, and respond well to tuberculin treatment. These may be cases of latent tuberculosis. He believes that from eight to ten per cent. of cases of interstitial keratitis are tuberculous, but syphilis and tuberculosis may co-exist and in cases where he obtains a positive Wassermann, and at the same time a positive tuberculin reaction, he gets good results from alternating courses of neosalvarsan, mercury, and tuberculin. Incidentally, he claims to have obtained beneficial results in interstitial keratitis (clearing up in two or three months) from the employment of repeated injections of neosalvarsan alternating with mercurial treatment.

In practice the author usually employs either albumose-free tuberculin or an emulsion form, and he gives preference to the percutaneous method. For this purpose albumose-free tuberculin is made up in a 1-5 glycerine dilution, and two or three times a week the patient rubs one to five drops of this into the skin of the arm. This method is milder in action than subcutaneous injection, takes longer to produce a given effect, seldom causes changes of temperature, and can be readily employed in out-door work. It is not always sufficient by itself, and in adults he often begins with a six weeks' course of injections, followed by a longer or shorter course of the percutaneous administration. In children he reverses the order. In any case, even when there has been apparent cure, the treatment is repeated after from three to six months. A. J. BALLANTYNE.

(7) **Streiff**, of Genoa, at the outset refers to the paper by Wirtz, abstracted in THE OPHTHALMOSCOPE, of December, 1913, dealing with the relationship between so-called rheumatic eye affections and secondary tuberculosis, and to other researches which have resulted in the detection of the tubercle bacillus in the blood of patients who gave neither the von Pirquet nor any of the other tuberculin reactions. As some observers have actually found the tubercle bacillus in 100 per cent. of all cases, it is very doubtful if the method is reliable. Although the author believes that there are many supposed rheumatic cases which are in reality cases of secondary tuberculosis, he also believes that there are rheumatic cases which have nothing to do with tuberculosis, and he protests against the generalisation that rheumatism

and the eye affections which accompany or alternate with it, are always of a tuberculous nature when tubercle bacilli can be found in the blood.

He approves generally of Wirtz's sweating treatment for pseudo-rheumatic cases, but points out that there are cases of eye disease of this nature which require a more vigorous line of treatment. In these cases he advocates heavy doses of salicylates. So satisfactory are the results that he uses the treatment even in cases of secondary tuberculosis which have none of the rheumatic character. He believes it is better to give large doses with intermissions than smaller continuous doses. A. J. BALLANTYNE.

(8) **Darier,** of Paris, has tried the local application of ethylhydrocuprëine in pneumococcal ulcer of the cornea. He has had good results, indeed, in one case astonishingly good results, but he has had only two cases. Further, the treatment was "complicated," if one may say so, by the use of other remedies, such as iodine, atropine, and Roux serum. Nevertheless, the fact remains that the ulcers healed up very quickly and in one case the rapid regeneration of the epithelium was a remarkable fact. The application of the drug is made in the powder form, a very minute quantity being employed. It causes considerable pain. Every hour, for three hours after the application, a 1 per cent. oily collyrium of the drug was instilled. Following the account of his two cases the author gives a *résumé* of the literature on the subject of ethylhydrocuprëine. S. E.

(9) **Allan,** of London, believes that aspirin might be more widely employed in eye work than it appears to be. It can be prescribed with perfect safety in large doses. SYDNEY STEPHENSON.

(10) **Lloyd Owen,** of Birmingham, devotes the Richard Middlemore Post-Graduate Lecture for the year 1913 to the ever-interesting subject of the treatment of diseases of the eye.

He looks with disfavour upon intra-ocular injections; but, on the other hand, speaks highly of the subconjunctival injection of this or of that remedy. He joins issue with the view that the benefit from this plan of medication results simply from the mere flooding of the lymph channels, and that a solution of sodium chloride is just as efficacious as any other. "The value of such injections," he remarks, "has passed beyond the stage of trial into that of facts." The injection of mercuric cyanide, or better still, of colloidal mercury, may arrest the suppurative process in secondary infections of wounds of the eyeball. He thinks that the chief use of the injections lies in subsiding or chronic stages of disease. Vision may be much improved by them in macular choroiditis, in disseminated choroiditis, and in choroidal changes due to myopia. Under the circumstances named, mercury and silver are recommended. Tuberculous choroiditis is enormously benefited by injections of guaiacol, 1 : 1000. Briefly, Lloyd Owen regards subconjunctival injections as "permanently valuable additions to our resources."

Pyocyanase, used in the form of instillations, is capable of freeing the conjunctival sac from staphylococci, pneumococci, and gonococci. Lloyd Owen believes that yeast serum is likely to be useful in recurrent styes, hypopyon-keratitis, iritis, and infective wounds. He surmises that sensitised vaccines will render aid in eye work. But in his view we cannot trust to serums or vaccines alone, but must adopt local surgical measures in those cases which call for them In all cases, furthermore, general constitutional treatment must be associated with the other remedies.

Between the tuberculous reaction as a means of diagnosis and the use of tuberculin as an ultimate curative agent, there is, to Lloyd Owen's thinking, a gulf fixed. For curative purposes he employs the von Ruck tuberculin, and supplements its action, which is slow, by the internal or subconjunctival administration of guaiacol camphorate. These remedies, however, are of limited value without fresh air, good feeding, cod liver oil, and a tonic hygiene. Lloyd Owen is not convinced that a reaction to tuberculin test is always to be considered as an absolute proof that the disease under investigation is caused by tubercle.

The author devotes a section of his lecture to the colloidal metals and their employment in ophthalmology. These metallic ferments not only stimulate phagocytosis but also destroy micro-organisms and their toxins. The drawback to the earlier colloid suspensions was their instability. It has now been found, however, that an unstable colloid may be rendered stable by the addition of a small amount of another colloid. These stable compounds, which are called "Collosols," are non-toxic, may be administered by the mouth, and are painless and innocuous when injected beneath the skin or into the blood-stream. The colloids of silver and mercury are in use, and those of other metals will doubtless soon be adopted now that they can be obtained in permanent condition. They are harmless to the living cell, and so far as laboratory experiments go, there is no known microbe that they are incapable of killing in six minutes. As an antiseptic before and after operations upon the eye, 5 per cent. colloid silver (*Argentum collosol*) will be found trustworthy, and Lloyd Owen now prefers that substance to the weak solution of argyrol, which he formerly used. In septic cataract wounds the colloid silver should be freely used, and also be given by intravenous injection. The administration of normal horse or other serum might also be continued, but the silver salt should be looked upon as the mainstay of treatment. All forms of acute conjunctivitis yield to the vigorous use of 2 per cent. to 5 per cent. collosol argentum. Infections of cornea or globe have been arrested by intravenous injections accompanied with frequent and vigorous inunctions of 15 per cent. silver colloid (made with a fatty base, not with vaseline) around the orbit and on the body. Purulent iritis, episcleritis, and severe ophthalmoblennorrhœa have been cured rapidly by intravenous injections of colloid silver.

Ionization by means of mercury, copper, and other substances has yet to be fully tested in diseases of the eye.

As to salvarsan, Lloyd Owen regards it as a very dangerous remedy, which as regards curative effects, does not outclass mercury or potassium iodide. Neosalvarsan is milder in its action. The author has a good word to say about the old-fashioned combination of mercury and arsenic (Donovan's solution), especially in chronic syphilitic affections of the uveal tract.

SYDNEY STEPHENSON.

(11) **Reeder**, of Ancon, concludes his somewhat omnibus communication on salvarsan with the following words: "The conclusions that I would arrive at from the study of the literature and from the cases observed are that salvarsan is inadequate to cure all cases of syphilis, that one dose is not sufficient in any case, that salvarsan when administered in selected cases is probably harmless, and that most of the by-effects, if not quite all, are due to the disease and not to the drug. It will prove of great benefit in cases of fulminating syphilitic iritis, but mercury and potassium iodide should be given after the patient is well started on the road to recovery. Except for experimental purposes I would not consider it wise to depend on salvarsan for a cure."

SYDNEY STEPHENSON.

CORRESPONDENCE.

[While The Ophthalmoscope will at all times welcome correspondence from its readers, the Editor does not hold himself responsible for any views expressed in this column.]

A NEW OPERATION FOR CATARACT.

Dear Dr. Thomson,—When I read your abstract in The Ophthalmoscope (January, 1913, p. 49), of "A New Method of Extraction of Cataract in the Capsule" (*Transactions Ophth. Society U.K.*, *Fasc.* 3, 1912), by J. S. Hosford, I intended to draw your attention to the fact that Dr. George A. Powers, of San Francisco, California, described in my "System of Ophthalmic Operations," 1911, p. 1214, an identical operation, but something occurred to distract my attention, and I have to apologise for not writing you sooner on the subject. I knew that Dr. Powers had been doing this operation for several years prior to sending me the manuscript at the end of 1910, and it was at my request that he placed it on record. I enclose an excerpt* from the work in question.

I remain, sincerely yours,
Casey A. Wood.

Suite 1208, Chicago Savings Bank Buildings,
State and Madison Streets, Chicago.
February 13th, 1914.

Excerpt.

*" My discovery began with the accident of trying to incise a lens capsule with a cystitome which proved to be dull, and which, instead of cutting, rotated the lens on its horizontal diameter, thus plainly rupturing the suspensory ligament. As I almost always operate without iridectomy, I have hesitated to pursue the matter, but have proceeded to incise the capsule in the usual way before extraction ; but I have a good many times done this *rotation of the lens*, and have never failed to accomplish it without any force or appearance of possible damage to the eye. In the last case, on which I operated a week ago, I had done an iridectomy four years before, and concluded to try to extract the lens *in its capsule.* With the eye well cocainized after an incision, including nearly one-half the periphery of the cornea, I passed the cystitome to as low a point as the iris would allow, plunged it into the lens substance (a little more deeply only than if I intended to incise the capsule alone), and then with the gentlest possible motion rotated the whole lens as a wheel. Very gentle pressure at the bottom of the cornea expressed the lens which, in formalin solution, showed very plainly the capsule unbroken. With proper cocainization it would seem that no vitreous need be lost during or after this operation ; certainly none was lost this time. The traumatism to the ciliary body is certainly less than in Major Smith's method, and the expression of the lens is easier than in the usual operation."

BOOK NOTICES.

Ossification in the Pathological Eye. (Les Processus d'Ossification dans l'Œil Pathologique. Revue générale.—Recherches personnelles.)

By LÉOPOLD BUSSY. Lyon : A. Rey, 4, Rue Gentil. Novembre, 1913.

The 212 pages of this Lyons thesis (inspired by Professor Rollet) are devoted by Bussy to the discussion of ossification as it affects the eye. His conclusions follow:—

1.—In the human eye ossifications have been described, of which the origin, site, nature and evolution differ.

2.—Those which have a teratological origin and which result from an anomaly in the phenomena which preside over the constitution of the crystalline lens and the optic cup are very rare. They take the form of small benignant tumours under the conjunctiva, *osteomata of the conjunctiva*.

3.—Others, rarer still, are also situated under the conjunctiva, but they are of inflammatory origin, and their chief cause is trachoma. They represent the transformation of newly-formed connective tissue into bone. They are accompanied by hyaline or amyloid degeneration, and are spoken of as instances of *ossifying conjunctivitis*.

4.—As regards the choroid, osteo-sarcomata have been described, but the cases which have served to create this type of intra-ocular ossification may be interpreted in another way. They are usually connected with old inflammatory ossifications upon which a sarcoma has been grafted. There are inflammatory ossifications of the choroid, secondarily complicated with sarcoma ; but it does not appear that we are authorised in describing an osteo-sarcoma of the choroid.

5.—We very frequently encounter inflammatory osseous new formations inside atrophied stumps. They represent the ultimate transformation of inflammatory exudations produced in the membranes and the media of the eye by infections. These exudations at first became organised into vascular fibrous tissue. Certain cells of the exudation, themselves arising from the lymphocytes, become differentiated into osteoblasts, secrete osseine, and make a primordial bone, which when revascularised, gives rise in its turn to definitive Haversian bone. Since the exudations may be produced in any part of the eye, ossification may be met with in all the membranes and in all the media of that organ. Very rare in the iris, the cornea, and the retina, they are commoner in the vitreous and the crystalline and more numerous still in the choroid, which is indeed their seat of predilection.

6.—All that has been said regarding intraocular inflammatory ossification applies also to intra-ocular inflammatory enchondromatosis, except that the latter is as rare as the former is frequent.

7.—The ætiology of the inflammatory ossifications is to be sought in an infection produced by a penetrating wound of the eyeball, by a spontaneous ulceration, or by a metastasis. New formations of bone may appear soon after the causal infection. They may become larger until they attain such dimensions that surgical intervention is necessary, or they may rest stationary, or even in some cases undergo absorption.

They constitute a very grave and constant menace, and may, in fact, be regarded as a frequent cause of sympathetic ophthalmia.

In the absence of really pathognomonic signs, radiography is the most certain means of diagnosing the condition.

An eye which contains bone is always useless, often troublesome and painful, and sometimes dangerous. Treatment may be summed up in the words "prompt enucleation."

8.—Experiments (choroidal graft) show that the eye is a favourable medium for the development of osseous tissue. It does not nourish the grafts (*greffons*), but, on the contrary, absorbs them. In the midst of the young connective tissue which is substituted for the resorbed graft the choroid forms new bony deposits.

9.—While placing ourselves in conditions analogous to those which entail the production of ossification of the eye in man, we have not obtained the formation of osseous tissue in animals. SYDNEY STEPHENSON.

Report on the Ophthalmic Section of the Department of Public Health (Egypt), 1912. By the DIRECTOR OF OPHTHALMIC HOSPITALS. Cairo: Government Press. Price P. T. 10. 1914.

We have been favoured with a copy of this interesting Government Report. With much of its contents the readers of this journal are already familiar through the writings of the Director of Ophthalmic Hospitals in Egypt, Mr. A. F. MacCallan. We know, for instance, of the establishment of permanent and temporary travelling hospitals, and have a general idea of the enormous amount of work which is being done.

The report commences with an introduction, in which the origin of the hospitals, the details of the staff and the clinical instruction, the finances, and the means of fighting eye disease and blindness are set forth. Then follow chapters entitled "Work and Progress during 1912," "Clinical," "Schools," "Blindness in Egypt," "Ophthalmic Policy in Egypt," and, finally, "Tables and Statistics." The last includes photographs and scale plans of various hospitals. We may be content to notice a few points only. The number of new cases treated during 1912 reached the total of 28,029. 6,942 operations were performed on 13,176 trichiasis patients, the operations most frequently performed being a modified Snellen and van Millingen's grafting of mucous membrane. There were 243 extractions of senile cataract and 152 trephinings for glaucoma, numbers which, although considerable in themselves, are overshadowed by the huge number of lid operations. Iridectomy for adherent leucoma was performed 978 times, owing to the frequency of corneal ulceration. 240 eyes were excised, and 52 eviscerated.

Turning to the question of trachoma MacCallan says that transmission of contagion by flies is probably not the most frequent of the various modes of infection. An attack of acute conjunctivitis frequently precedes infection with trachoma. Hence it was formerly thought that trachoma always began acutely. These acute symptoms are most often caused by well-known organisms, the Morax-Axenfeld diplobacillus, the Koch-Weeks' bacillus and the gonococcus, and the trachoma infection is conveyed along with the highly contagious purulent discharge of these infections. Although it is already fairly well-known, it is perhaps worth while to repeat here the classification of trachoma adopted by MacCallan, a development of Raehlmann's classification.

Trachoma, Stage I. Slight roughnesses, forming greyish islands which are semi-transparent and almost non-vascular.

Trachoma, Stage II a. Numerous greyish follicles protrude above the surface of the conjunctiva which easily rupture on pressure.

Trachoma, Stage II b. Formation of red raspberry-like papillæ which mask more or less the typical gelatinous follicles. Two sub-varieties may be distinguished: *Trachoma, Stage II* b^1, which is unmixed trachoma, and *Trachoma II* b^2, which is trachoma complicated with spring catarrh.

Trachoma, Stage II c. Trachoma complicated by gonococcal conjunctivitis.

Trachoma, Stage III. In which cicatrization is beginning.

Trachoma, Stage IV. In which cicatrization is complete.

The treatment of the various stages, which of course may overlap one another, is indicated:—

Trachoma I. Silver nitrate 2 per cent. applied to the lids by means of a tampon.

Trachoma IIa. Mechanical rupture by means of Graddy's forceps and a sharp spoon followed by the application of perchloride of mercury 1 per cent. on a tampon of cotton.

Trachoma IIb. Heisrath's combined excision of the tarsus and conjunctiva.

Trachoma IIc. Application to the conjunctiva of 2 per cent. silver nitrate.

Trachoma III. Application of copper sulphate stick.

Lastly, we may notice the incidence of blindness in Egypt. During the examination of over 43,000 patients in 1912 no fewer than 8,603 eyes were found to be blind. Leaving out 11 cases of congenital blindness, of the remaining cases of acquired blindness over 6,000 owed the blindness to conjunctivitis and its results in one form or another including secondary glaucoma, about 1,000 to primary glaucoma and half that number to cataract. Injury accounted for 47, and only 25 were blind as the result of operation. Only four cases were blind from small-pox, owing to the efficacy of the vaccination regulations.

We have said enough to show that this report is of much interest and importance, although, of course, it deals largely with conditions which do not prevail in this country. ERNEST THOMSON.

NOTES AND ECHOES.

Deaths.

A NOTED scientist in the person of George James Burch, M.A., D.Sc., passed away at Oxford on March 17th last, in his sixty-second year. He was a Fellow of the Royal Society, and had formerly been professor of physics in University College, Reading, and University Extension Staff Lecturer at Oxford. Dr. Burch was widely known by reason of his researches upon electricity and light, especially in their relationship to physiology. He was also an authority upon colour-vision. Since the institution of the Diploma in Ophthalmology by the University of Oxford several years ago, Dr. Burch had conducted the classes and lectured upon physiological optics, which forms part of the course. Dr. Burch had contributed several communications and reviews to the columns of THE OPHTHALMOSCOPE. The interment took place on March 20th at Wolvercote Cemetery. Dr. Burch was a man of singularly unassuming mind, and of great lovability of temperament. R.I.P.

The veteran ophthalmologist Karl Völckers, formerly professor of clinical ophthalmology in the University of Kiel (1868-1907), died at the age of 78 years on February 2nd last.

The death is announced of Gustav Pfalz, director of the eye clinic and *dozent* of ophthalmology in the Academy of Practical Medicine at Düsseldorf. Pfalz died quite unexpectedly in the midst of his work.

Dr. Schönenberger, of St. Gallen, died on February 24th last.

* * * *

Appointments. MR. ARNOLD LAWSON has been appointed ophthalmic surgeon to the Middlesex Hospital, London.

Mr. George Maxted has been appointed assistant surgeon to the Norwich and Norfolk Eye Infirmary.

Mr. L. A. Parry has been appointed assistant surgeon to the Sussex Eye Hospital, Brighton.

Dr. Roche has been appointed ophthalmologist to the Marseilles Hospitals.

Dr. Vinsonneau has been appointed professor of clinical ophthalmology in the Angers School of Medicine in succession to Dr. Motais, deceased.

Dr. Kraus, of Marburg, has been appointed director of the eye clinic at Düsseldorf in succession to Pfalz, deceased.

* * *

New Year's Honours. THE Viceroy of India has conferred the title of "Rai Bahadur" on Mr. Chaudra Mohan Dé, lecturer on ophthalmology and ophthalmic surgeon Thomason Medical School, Agra, U.P., India.

* * * *

Professor von Hippel. ARTHUR VON HIPPEL, director of the University Eye Klinik in Göttingen, celebrated his golden jubilee as doctor on February 18th last. His friends and students commemorated the occasion by presenting him with a *plaque* with his portrait thereon.

* * * *

British Medical Association: Section of Ophthalmology. THE Section of Ophthalmology, which meets on July 29th, 30th, and 31st next at Aberdeen, has the following officers:—

President: Charles Howard Usher, Aberdeen.

Vice-Presidents: Alex. Rudolf Galloway, Aberdeen; Karl August Grossmann, Liverpool; Nathaniel Bishop Harman, London; Arthur Henry Havens Sinclair, Edinburgh.

Hon. Secretaries: Francis Robert Hill, 62, Warwick Road, Carlisle; Miss Euphan Montgomerie Maxwell, 19, Lower Baggot Street, Dublin; Wm. Clark Souter, 12, Bon Accord Square, Aberdeen.

* * * *

Ophthalmological Prizes. THE Council of the British Medical Association will award the Middlemore Prize this year to the writer of the best essay on "The Physiology of Vision and Fusion." Essays must reach the Medical Secretary (British Medical Association, 429, Strand, W.C.) on or before May 30th, 1914. The prize, which was founded by the late Mr. Richard Middlemore, of Birmingham, consists of a cheque for fifty pounds and an illuminated certificate.

It is announced that the Necker Hospital for Sick Children, in Paris, will award an annual prize of one thousand francs to the best work done in France upon the causes and the treatment of diseases of the eye. The first award of the prize will be in January, 1915. Essays must be addressed, before November 1st, 1914, to Dr. Poulard, 22, Avenue Friedland, Paris.

* * * *

Ophthalmological Society of the United Kingdom.

THE Annual Congress of the Ophthalmological Society of the United Kingdom will be held under the Presidency of Mr. F. Richardson Cross, on Thursday, Friday, and Saturday, the 23rd, 24th, and 25th of April, 1914. The meetings will take place at the house of the Royal Society of Medicine 1, Wimpole Street, W. On Thursday and Saturday mornings papers will be read from 10 a.m. to 1 p.m. ; on Friday morning there will be a discussion, to be opened by Mr. E. Treacher Collins and Lieut.-Col. H. Herbert, on "Post-operative Complications of Cataract Extraction." The annual business meeting will be held at 4 p.m. on Thursday, and at 5 p.m. on the same day Prof. Uhthoff, of Breslau, will deliver the Bowman Lecture on "Experiences and Considerations on the Importance of Ophthalmology in Brain Surgery." Members of the Society and their friends will dine together on Thursday evening. It has been arranged to hold a Clinical meeting on Friday afternoon at the Central London Ophthalmic Hospital, Judd Street, W.C. During the Congress a museum of objects of ophthalmic interest will be exhibited in the Bowman Library at the Royal Society of Medicine. Communications respecting the scientific meetings should be addressed to Mr. G. Coats, 50, Queen Anne Street, W. ; respecting the museum to Mr. M. S. Mayou, 30, Cavendish Square, W. ; and respecting the dinner to Mr. Elmore Brewerton, 84, Wimpole Street, W.

* * * *

Ophthalmia neonatorum.

ON and from this day (April 1st) ophthalmia neonatorum becomes a notifiable disease throughout England and Wales. Any purulent discharge from the eyes of an infant, beginning within twenty-one days of its birth, is regarded as ophthalmia neonatorum within the meaning of the Order.

* * * *

French Society of Ophthalmology.

THE subject chosen for discussion at the next meeting of the Society (May 4th, 1914) is "The Treatment of Ocular Syphilis." The discussion will be opened by Dr. Louis Dor, of Lyons.

* * * *

Condition of the Blind.

ON March 11th, Mr. G. J. Wardle, the labour member for Stockport, in moving a resolution in the House of Commons in favour of State provision whereby capable blind persons should be made self-supporting, and the infirm and incapable blind should be properly maintained, made some interesting statements concerning the blind in this country. For example, of between 32,000 and 34,000 blind, 10,000 were in workhouses or in receipt of parish relief, 7,000 were making their bread exposed to all sorts of weather. Only 3,000 were employed in voluntary institutions, and they were receiving less than ten shillings a week. Of the capital sum of two or three million pounds provided by charity, a large part was eaten up in the organisation and, salaries of the fifty disbursing bodies. The cost of obtaining subscriptions ranged from 25 per cent. to 33 per cent. of the sum collected. There should be an enquiry into the allocation of the money left for the blind. The State should see that no blind person was neglected and obliged to beg his bread in this great and rich country. Mr. Herbert Lewis, Parliamentary Secretary to the Local Government Board, in the course of a sympathetic speech, gave statistics about blindness in this country, detailed what had been done in the way of prevention, and announced that the Government intended at the earliest possible moment to appoint an Interdepartmental Committee to consider the whole subject of the blind. That was an essential preliminary to any action being taken on the lines suggested by Mr. Wardle. The motion was supported by all parties and agreed to.

THE OPHTHALMOSCOPE DIARY.

	1914.	
Midland Ophthalmological Society	April 7th	Birmingham
Ophthalmological Society of the United Kingdom	April 23rd to April 25th	London.
French Ophthalmological Society	May 4th	Paris.
Section of Ophthalmology: Royal Society of Medicine.	May 6th	London.
Section of Ophthalmology: Royal Society of Medicine.	June 10th	London.
Oxford Ophthalmological Congress	July 8th to July 10th	Oxford.
British Medical Association: Section of Ophthalmology.	July 29th to July 31st	Aberdeen.
International Congress of Ophthalmology.	August 10th to August 15th	St. Petersburg.
American Academy of Ophthalmology and Oto-Laryngology	October 19th to October 21st	Boston, Massa.

THE

OPHTHALMOSCOPE.

A MONTHLY REVIEW OF CURRENT OPHTHALMOLOGY.

Vol. XII.—No. 5.] *MAY 1, 1914.* [Two Shillings.

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ORIGINAL COMMUNICATIONS.

THE LEVATOR PALPEBRÆ SUPERIORIS MUSCLE: THE ATTACHMENTS AND RELATIONS OF ITS APONEUROSIS.*

BY

S. E. WHITNALL, M.A., M.B.,

SENIOR DEMONSTRATOR OF ANATOMY IN THE UNIVERSITY OF OXFORD, ENGLAND.

THE levator of the upper eyelid arises from the bone just above the optic foramen at the apex of the orbit and passes forward towards the base, where the fleshy belly of the muscle terminates in its expanded tendon or aponeurosis. This is a band of dense connective tissue which stretches transversly across the base of the orbit just behind its upper margin, arching over the globe of the eye from side to side. From the anterior edge of the band connecting strands of tissue pass forwards to the eyelid, whilst its extremities are anchored to the margins of the orbit opposite the medial and lateral canthi. In shape and mode of action the aponeurosis may to a

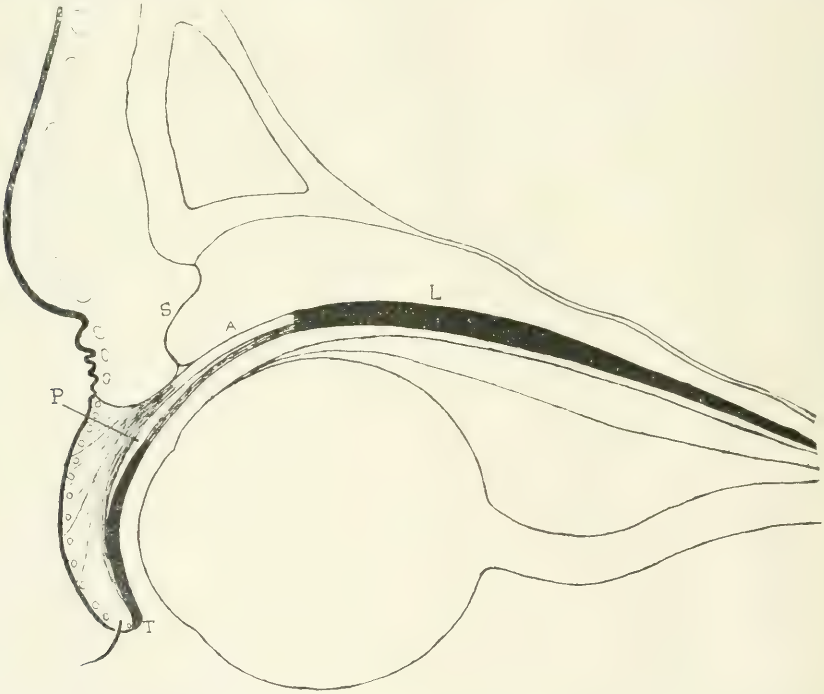

FIG. 1.—Diagram of a sagittal section through the orbit, to illustrate the Palpebral attachments of the Aponeurosis (A) of the Levator Palpebræ Superioris muscle (L) to the skin and Tarsal plate (T) of the upper eyelid. The superior Palpebral muscle of Müller is shown lying immediately beneath the Aponeurosis. The circles drawn beneath the skin represent fasciculi of the Orbicularis Oculi muscle cut in section × 2.
S.= Septum orbitale.
P.= Preseptal space, which is opened into in Fig. 2.

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* Part of a communication to the Oxford Ophthalmological Congress, July, 1913.

certain extent be likened to the vizor of a helmet: it is swung backwards over the globe by contraction of the muscle, its anterior connections pulling the eyelid with it and so forming the superior palpebral fold of the skin.

The anterior or *palpebral* connections of the aponeurosis present a certain complexity in their arrangement, the details of which are of some practical interest and will be considered first, but it is the relations and attachments of the medial and lateral extremities of the band, or its *orbital* connections, to which attention is specially drawn in this paper, and which are but rarely accorded even mention in descriptions of the muscle.

The *palpebral* attachments of the aponeurosis are studied best in a sagittal section of the orbit (Fig. 1). Here the muscular portion of the levator is seen to end anteriorly in a tendon about 7 mm. long, which is the aponeurosis cut in section. If the skin of the eyelid be pulled forward the anterior edge of this tendon is seen breaking up into numerous fine strands of connective tissue which radiate forwards towards the lid. The uppermost fibres meet and fuse with the septum orbitale—that curtain of connective tissue which is attached to the margin of the orbit and lines the superimposed orbicularis oculi muscle. By the junction of septum orbitale and aponeurosis a smooth concave barrier is presented to the orbital fat above the globe. The lowermost fibres of the aponeurosis pass freely over the upper margin of the tarsal plate to be fixed to the lower half of its anterior surface; the septum orbitale has therefore no connection at all with the tarsal plate owing to the intervention of the aponeurosis fibres. The intermediate fibres between the two extremes of this radiation can be traced in microscopical sections through the fasciculi of the overlying orbicularis oculi muscle to reach the skin over an area extending from the region of the superior palpebral fold nearly to the margin of the lid. The levator is further connected with the tarsal plate by the agency of Müller's superior palpebral or tarsal muscle. This is a thin layer of involuntary muscle fibres underlying the aponeurosis, in close contact and often confused with it. In the sagittal section through the orbit, the aponeurosis at first sight appears to be a single structure, but it can be readily separated by a blunt instrument into two quite separate layers, an upper (the aponeurosis itself) which traced forward towards the lid is seen to split up into numerous strands which pass over the upper edge of the tarsal plate, and a lower (Müller's muscle) which is directly attached to the upper margin of the plate, and which is covered by conjunctiva on its inferior aspect. Both layers are continuous posteriorly with the belly of the levator muscle. The space between the two structures is called the "preseptal space" by Clermont.

There is a point of practical importance in the relations of the aponeurotic fibres which pass over in front of the tarsal plate. In a dissection of the eyelids from the front, layer by layer, the usual description is that after removal of the skin and orbicularis oculi muscle, the tarsal plate is exposed. It will be found, however, that beneath the orbicularis muscle a further layer of connective tissue has to be dissected away before the plate is fully exposed. This layer can be reflected upwards, becoming more easily separable from the plate towards its upper margin, and will be found to be continuous with the aponeurosis. The membrane so formed by dissection consists of the palpebral attachments of the aponeurosis which have been severed in front in reflecting the skin and orbicularis muscle, whilst the connections with the face of the tarsal plate behind have been cut through in exposing this. Fixed to the anterior face of this dissected layer above is the septum orbitale; posteriorly, and thus exposed by its reflection, is the tarsal plate and Müller's muscle. (Fig. 2.)

The *orbital* attachments of the aponeurosis may be displayed by removing the roof of the orbit and the bone forming the supra-orbital margin. The pulley of the superior oblique muscle should not be disturbed, nor should the lateral rim of the orbit be sawn through at a point below the zygomatico-frontal suture. If now the muscle be cleared from its fascial sheath and its connections, and studied from above (Fig. 3) it will be seen that the flat muscular portion expands as it passes forwards to end in the aponeurosis; this expansion being most marked in the anterior third and in a lateral direction; the medial margin of the muscle continues almost in a straight line forwards to a point where it crosses the reflected tendon of the superior oblique muscle; the lateral margin curves gradually outwards and downwards in the direction of the lateral canthus. The aponeurosis is seen as a glistening band stretching from side to side across the orbit, but there is an important difference not only in the relations but also in the structure of its two extremities. Laterally the aponeurosis cuts into the lacrymal gland, subdividing it into upper and lower lobes; traced onwards the lateral extremity of the aponeurosis forms a strong tendinous band which is fixed to the tubercle on the malar bone just within the orbital margin and exactly opposite the lateral canthus. Superficial to it are the septum orbitale and orbicularis oculi muscle which in this situation form the lateral palpebral raphe. The narrow interval between the aponeurosis and raphe is sometimes occupied by a few lobules of the lacrymal gland. Deep to the aponeurosis at this attachment lies the true lateral palpebral ligament, which fixes the tarsal plates to the same tubercle and is often confused with the raphe or not mentioned.

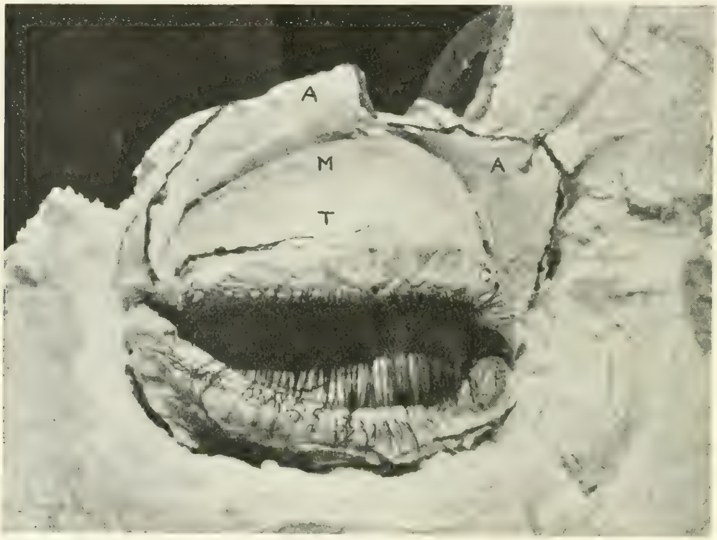

Fig. 2.—Dissection of the right upper eyelid from in front after removal of the skin and Orbicularis Oculi muscle. The Aponeurosis of the Levator Palpebræ Superioris muscle with its attachments to the skin (A) has been reflected upwards from the face of the Tarsal plate (T), to the upper border of which is attached Müller's superior Palpebral muscle (M). By the reflection of the connective tissue attachments A A the Preseptal space, the position of which is seen in fig. 1, has been opened up.

On the other hand, if traced medially the aponeurosis is seen to bend downwards at an angle over the reflected tendon of the superior oblique muscle, and from this point at once loses its definite tendinous character. It can be followed with difficulty in the form of strands of connective tissue blended with the septum orbitale and by fusion with the medial palpebral ligament it gains attachment to the medial margin of the orbit. The opposed surfaces of the aponeurosis and tendon of the superior oblique muscle are in close contact, and on separation appear smooth and shiny, though a bursa between them cannot definitely be said to exist.

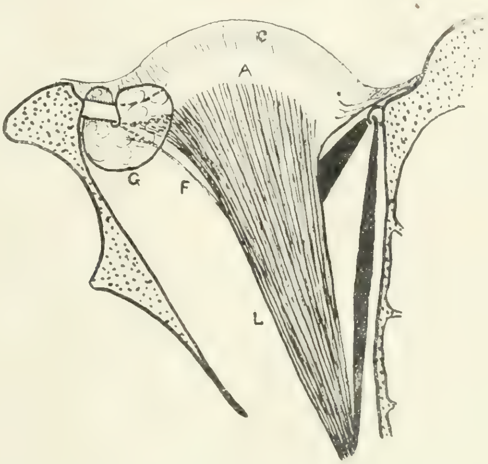

FIG. 3.—Diagram drawn from dissection of left orbit seen from above, the roof and upper margin having been removed and the Levator Palpebræ Superioris muscle cleared of its fascial sheath with its connections. 8 b L

L.= Muscular portion of the Levator.

A.= Aponeurosis and C.= connections of anterior margin of this to the skin.

F.=Fasciculi occasionally passing from lateral margin of Levator to Lacrymal Gland (G).

Thus there is a striking difference in the structure of the two extremities of the aponeurosis, and the much stronger development of the lateral one with the greater extension of the muscle on this side point to this as the chief attachment. Moreover the lateral horn of the aponeurosis may be a factor in maintaining the position of the lacrymal gland, the " suspensory ligaments " of which are as feebly developed and as difficult to define as the " capsule " itself. The lacrymal gland is as it were folded round the aponeurosis, and is firmly connected with its posterior border. Further, the fascial sheath of the levator sends off-shoots to the gland ; and I have seen these reinforced by strands of muscle fibres from the lateral margin of the muscle comparable to the similar fasciculi which sometimes pass from its medial margin to the pulley of the superior oblique muscle as the " tensor trochleæ" of Budge. It is, therefore, possible that in contraction of the levator the lacrymal gland is swung slightly backwards with the lateral part of the aponeurosis, and, on relaxation of the muscle, would tend to resume a more anterior position by the resiliency of the orbital fat which is packed against it behind. In a specimen where muscle fibres passed from the lateral margin of the levator to the gland, traction upon the muscle pulled the gland backwards, even though the tissues were somewhat hardened from being preserved in spirit.

Finally, there is another point of interest in connection with the medial extremity of the aponeurosis. As noted by Merkel, there is commonly in old people a swelling visible in the inner corner of the upper eyelid, just above the medial palpebral ligament ("*bourrelet senile*" of French authors). After dissecting away the superficial structures (skin, orbicularis oculi muscle, and septum orbitale) in this region (Fig. 4), the swelling is seen to be caused by a protrusion of hernia of the orbital fat through a triangular space bounded by the orbital margin medially, the tendon of the superior oblique muscle superiorly and the medial extremity of the aponeurosis to the outer and lower side. The only barrier to the orbital fat here is formed by the septum orbitale and the overlying orbicularis oculi muscle. The former is less easily definable by dissection in this region than anywhere else over the base of the orbit, being not only very thin, but perforated by vessels and nerves, whilst with advancing age the loss of tone of the muscle fibres becomes pronounced. There is consequently little support to the orbital contents in this region. The exact site of the protrusion where it is not evident can be shown by pressing the globe backwards, and so causing the orbital fat to bulge forwards beneath the eyelid.

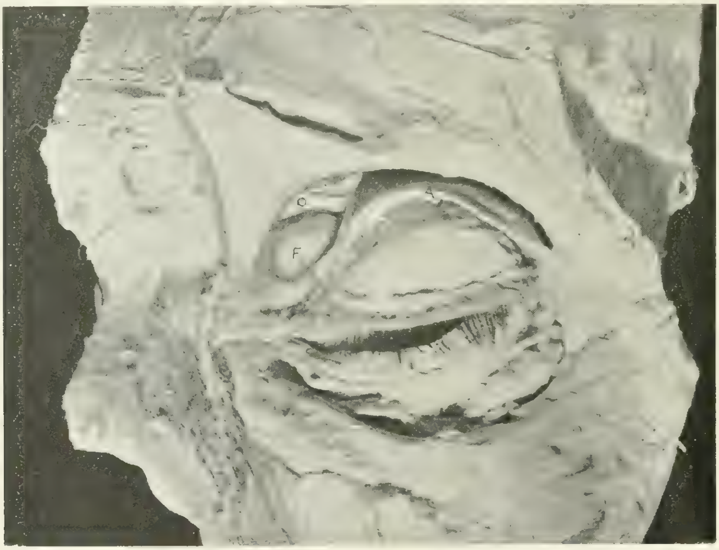

FIG. 4.—Dissection of left orbit seen from in front, the skin, Orbicularis Oculi muscle and Septum Orbitale in greater part having been removed, a part having been left and pinned up. The orbital fat (F) is seen protruding below the reflected tendon of the Superior Oblique muscle (O) and between the orbital margin and the medial extremity of the Aponeurosis (A) of the Levator Palpebræ Superioris, thus causing the swelling in the inner corner of the upper eyelid seen in the aged.

Above the tendon of the Superior Oblique is seen a loop formed by the terminal part of the Ophthalmic Artery.

Summary.—The expanded tendon or aponeurosis of the levator palpebræ superioris muscle has both palpebral and orbital attachments. By the former it is connected to the skin and face of the tarsal plate of the upper eyelid by numerous slender fibres which radiate forwards from its anterior edge. In exposing the tarsal plate from the front these fibres are condensed by dissection into a layer of connective tissue which intervenes between the orbicularis oculi muscle and the plate. By its extremities the aponeurosis is anchored to the margins of the orbit opposite the medial and lateral canthi. The lateral extremity is much the stronger, and in the form of a ligamentous band cuts into and is firmly attached to the lacrymal gland; it is continued on to be fixed to the tubercle on the malar bone just within the orbital margin opposite the lateral canthus. From the position of this band it appears well adapted not only to maintain the lacrymal gland in place, but also to impart some movement to it, an action which may be assisted sometimes by the presence of lateral offshoots from the belly of the muscle itself to the gland. On the medial side the aponeurosis loses abruptly its tendinous nature as it passes across and comes into close contact with the reflected tendon of the superior oblique muscle. From this point it can be traced with difficulty towards the medial palpebral ligament in the form of loose strands of connective tissue. This extremity of the aponeurosis, with the orbital margin on the inner side and the tendon of the superior oblique muscle above, demarks a triangular space in the upper inner region of the orbit; through this space the orbital fat bulges when the overlying orbicularis oculi muscle has lost its tone, and thus there is formed the swelling in the inner corner of the upper eyelid so often seen in the aged.

NOTE.—The levator and the underlying superior rectus muscles are intimately connected by the fusion of their fascial sheaths. Anteriorly where the two muscles separate to reach their several insertions the fascia between them forms a thick mass which is fixed to the superior conjunctival fornix. This indirect fascial attachment, which is shared with the superior rectus, is described as an additional insertion of the levator palpebrae superioris.

The palpebral connections of the levator have been studied especially by Wolff, *Zeitschrift für Augenheilkunde*, Bd. XIII, 1905, S. 440, and Clermont, *C. R. de l'Assoc. des Anat.*, Suppl., 1909.

REPORT ON TWENTY-SIX SCLERO-CORNEAL TREPHININGS (ELLIOT'S OPERATION) FOR GLAUCOMA.*

(*Concluded.*)

BY

WENDELL REBER, M.D.,
PHILADELPHIA, PA., U.S.A.

Case 12.—L. K., male, tailor, aged 54. Pain in left eye one year. Right eye no pain. Vision right eye (corrected) equals 5/9, left eye light perception. Right eye, conjunctiva shows the cicatrices of old trachoma. The media are clear, however, and there is a deep pathologic cup. Left eye, tension normal. Old conjunctival cicatrices; thin pannus upper third of cornea. Lens cataractous. Pupil 5 mm. immobile. Tension plus 3. Trephining left eye December, 1912. Large spontaneous hyphæma on the 7th day after operation. Gradually cleared under dionin and sodium iodid. Healing uneventful, and, to our surprise, the pannus cleared away rapidly. One month later, vision in the left eye equalled 5/200. Tension normal.

Case 13.—A.T., coloured, female, aged 43. Glasses seven years ago, at which time vision and eye grounds were normal. Sight had been failing for over a year. Vision: right light perception, left 5/12. Tension was right 35, left 30. Chronic simple glaucoma of both eyes.

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* Presented to the American Academy of Ophthalmology and Oto-laryngology at the Chatanooga Meeting, October 28th, 29th, 30th, 1913.

August 19th, 1912.—Trephined right eye. Uneventful recovery. August 23rd, 1912.—Trephined left eye. Patient vomited during the night and showed prolapse of iris the next day. Under chloroform, the flap was loosened, and the protruding iris excised. The recovery was good and prompt. One year later vision in the left eye had risen to 5/6. Tension right and left 16. Both cicatrices pit freely.

Case 14.—Miss N., aged 55. Nurse. June 17th, 1913.—Progressive chronic simple glaucoma for ten years at least. Marked failure of vision last three months. Been told at two different hospitals that nothing could be done for her. General health very poor. Seldom goes out of the house. Vision was right light perception, left 2/60. No visual field, not even candle field could be gotten in right eye. Tension: right, 26; left, 28. The eyes were normal anteriorly save for shallow anterior chambers. Pupils 6 mm. and react 1 mm. in each eye. Media are clear and deep (1 mm. to $1\frac{1}{2}$ mm.), and pathologic excavation in each eye.

June 25, 1913.—Double trephining. Large hæmorrhage completely filled anterior chamber of right eye immediately after the trephine entered the chamber. The lens did not seem to dislocate, so that we concluded the hæmorrhage was from an anterior ciliary vessel. Left eye, trephining without iridectomy.

One week later.—Hyphæma has disappeared from anterior chamber of right eye. Pupils both eyes 4 mm. and round.

Two months later.—Tension: right, 20; left, 18. Vision, right light perception, left 4/60 and orientation much improved. At this date a form field could be secured. The patient now goes out a little by herself, something she has not done for three or four years.

Case 15.—Mrs. H. H., aged 60. A plethoric woman, who has always enjoyed quite good health. She is the only glaucoma patient I have seen for years whose gastro-intestinal functions were perfect. First consulted me in 1906 with a tense hard left eyeball. The anterior chamber was very shallow, the lens was somewhat hazy, but the fundus was seen plainly enough to detect a deep pathologic cup. Tension left eye was plus 2, and vision equalled 1/200. Right eye was normal anteriorly, media clear, optic nerve showed beginning pathologic excavation and corrected vision of 5/6. Under miotics, both eyes remained quiet, but about a year ago, the left eye began to get painful. By this time there was complete secondary cataract, and not even light perception. The right eye has remained unchanged and all through the seven years has responded beautifully to miotic treatment. Because of the pain in the left eye, tension being 35 mm., a trephining was done May 28, 1913. The iris prolapsed into the scleral opening and a small iridectomy was done. The iris was found very friable and bled freely after the iridectomy, filling the anterior chamber. The eye slowly went into a quiet iritis, and was a long time quieting down. The hyphæma disappeared in about two weeks, but at the end of the month, the anterior chamber filled up spontaneously, (the tension rose to 10 mm.), showing plainly the characteristics of the degenerative eye that it was. This is the type of eye that almost surely develops expulsive choroidal hæmorrhage after any operation that postulates a large wide corneal wound, such as von Graefe's or Lagrange's method. The same was true of two other cases in this series.

This patient's left eye has been three months in becoming absolutely quiet, but has been perfectly painless all through the process. Tension now equals 20 mm., although the anterior chamber is practically abolished. I am myself not at all satisfied with the result in this case, but the patient professes to be entirely so. Would that all ophthalmic patients were as philosophic and optimistic.

Case 16.—This has proved to be one of the most interesting of the series :

R. L., coloured female, aged 30. Stated that up to six months ago both eyes were normal in every way ; three months ago right eye began to inflame. She was carefully treated by a *confrère* in a Southern city. After ten weeks of treatment she came north, and was admitted to my service at the Polyclinic Hospital on 15th May, 1913. The right eye was badly congested, stony hard, tension 45 mm., pupil 7 mm., lens hazy, no fundus view obtainable. The left eye was normal anteriorly, media clear, and the ophthalmoscope revealed a beginning glaucomatous excavation, probably superimposed upon an old, very large, physiologic excavation. Tension in this eye was 32 mm., and vision 6/12.

The Wassermann and von Pirquet reactions were negative, notwithstanding which she was thoroughly mercurialised, and miotics were used vigorously. The results were unsatisfactory, so that, on 8th June, 1913 (three weeks after admission), double trephining with iridectomy was done. Atropine was instilled in the left eye before closing it, and for three days afterwards once a day. For a week everything went well, but on the ninth day keratitis punctata began to develop in both eyes, and on the twelfth day after operation, the right eye (the degenerate one) developed a large spontaneous intra-ocular hæmorrhage, as in the preceding case. Once more I congratulated myself that I had not attempted the classic iridectomy on this eye, as I am persuaded that dire disaster would have attended it. Both eyes were vigorously treated with dionin and atropia locally, and atropia and calomel internally, combined with cabinet baths. The right eye quieted down slowly, and the left eye quickly, so that by October 14th, 1913, the cornea was entirely clear, and vision had risen to 6/5. The visual fields of this day for the left eye were absolutely characteristic. Suspecting a latent nasal disorder, she was referred to Dr. Ralph Butler, who reported obstructive ethmoid disease.

Summary and Remarks.

To summarise from the foregoing table 26 eyes were operated on by Elliot's method in 16 subjects. The results are as follows :—

In six eyes that were sightless, the seat of absolute glaucoma, and in every way degenerated eyes, the patients were rendered free from pain and an eyeball that was cosmetically satisfactory was preserved to them. This is no small matter, as they were all the very type of eyes that are likely to develop expulsive choroidal hæmorrhage at the time of operation. Moreover, the teaching in many quarters is that in absolute glaucoma, the safe measure is enucleation, an operation from which people instinctively shrink with horror. If trephining will preserve to such patients an eye that will be painless and quiet, it has on this premise alone proven its title as an acceptable operation.

In five other eyes that were sightless, there was a small degree of vision gained by the operation, such as hand movements at from 1 to 3 feet.

In the remaining 15 eyes the results were good in that the eyes gained considerably in vision and in usefulness. The greatest gain in vision after trephining was from 2/60 to 6/12. The least gain was from 5/12 to 5/10, but this gain was greater than appears on its face, for it was the patient's remaining eye, the fellow eye having been already blinded by chronic simple glaucoma. To-day (after one year) this patient's optic nerve excavation remains just what it was one year ago. His field of vision is enlarged and the cicatrix is filtering nicely; we are therefore justified in feeling that the usefulness of this eye will be preserved to him for many years, which, after all, is all that can be claimed for any glaucoma condition.

It may be asked whether trephining should be done in chronic simple glaucoma, and, if so, when? Our answer would be, that so long as a chronic simple glaucomic can be kept in the enjoyment of reading vision by the use of miotics, right living, and good general elimination (skin, kidneys, and bowels) with a fair-sized visual field and not too marked an excavation of the nerve head, one would not be justified in operating. But if the vision falls off or the visual fields begin to contract, with rise of tension, notwithstanding local and internal treatment, then operation *must* be seriously considered. We have under our care patients with chronic simple glaucoma who have preserved practically full vision for ten to fifteen years under the above drug treatment, and we hold that operation under such conditions would not only be meddlesome surgery, but worse. To let well enough alone is the part of wisdom and the mark of the wise surgeon, but to fail to proffer surgical aid when things begin to go to the bad, in spite of the best medical treatment, is to fail in the trust reposed in us.

Our experience in these twenty-six operations has brought with it many lessons.

The first and most important is that *we now approach a glaucomatous eye from the surgical standpoint with a hopefulness that we have never enjoyed up to this time.* We frankly confess that up to two years ago we deferred operations in every case of glaucoma that was not acute or fulminant until it became really a last resort; this because of our disastrous experience in three cases with iridectomy.

The second lesson is that the operation is not so brilliant in performance, in fact, is much more tedious of performance then iridectomy. This should not weigh against trephining, for ever and always the safest surgical procedure must be the best, and we believe sclerostomy to be much safer as an operation than iridectomy.

The third lesson is that one must expect a much longer postoperative reaction after trephining than after iridectomy, which does not alter the usual channels of circulation in the eye, while the very essence of sclero-corneal trephining is that it provides a subconjunctival escape for the lymph that has been blocked in the anterior ocular segment. It is our feeling that the prolonged postoperative reaction under the conjunctival flap is due to the presence of the lymph from the anterior chamber, which at first acts almost like a foreign substance, perhaps a biochemical reaction. Gradually, the eye becomes adapted to the new channel of filtration, and the reaction subsides.

The fourth lesson is that, as Col. Elliot has already pointed out, "quiet iritis" is not infrequent, and that the use of atropin in the eye from the second or third day onward for ten to twelve days is generally beneficial.

The fifth lesson, which has also been dwelt on by Col. Elliot in his book, is that a large flap affords the best chance for the establishment of subconjunctival filtration. If the flap is made so as to bring both sides of the flap down to the limbus on either side, the cicatrix which forms is almost sure to interfere with subconjunctival filtration.

The sixth lesson is, that if the conjunctival tissues are found thick and infiltrated it were wise to use a stitch, The only case in which we found such tissues presented a reversed flap lying over the cornea, when inspected the following day. Under chloroform anæsthesia, it was easily stitched in place and the recovery was uneventful.

The seventh lesson is, that once the scissors have carried the flap down to or near the limbus, the flap should not be held with any forceps, but is best held down with some cotton wrapped on a wooden applicator. This quite suffices to hold the flap down while the conjunctival layer of the cornea is being split off, and provides a mop in the operator's left hand for ready use.

The eighth lesson is that a clean sharp cut through the sclera is a great desideratum. To our way of thinking, this is best accomplished by some manner of mechanically-rotated trephine. The von Hippel appliance answers to this description after a fashion, but it is a top-heavy device, it may need rewinding of the spring to complete the perforation of the sclera, and it somewhat obscures the field of operation. We have, therefore, had made some straight tubular trephines, that are easily slipped into the catch of the ordinary dental engine with its flexible shafts, and this has served our purpose beautifully. The only objection to it is that the dental engine cannot be slipped into our operating bag and carried to a patient's home or to the hospital. We are therefore having a small flexible shaft attached to a tiny 8 oz. motor that can be driven by an ordinary dry battery. This whole outfit should fit readily into anyone's operating kit. Lacking this, however, my preference would be for the von Hippel trephine and last for the hand trephine. All trephines should be as carefully cleaned after an operation as a gun barrel and lubricated with a preservative oil, such as "3 in 1."

The ninth lesson is that one can hardly split off the conjunctival layer of the cornea too far forward to facilitate accurate placement of the trephine. Dutemps' recent researches ("*La trépanation cornéo-sclérale 'Elliot,' étude technique, reserches anatomiques et experimentalles.*" Paris. Vigot frères, 1913) on fistulation of the cornea in animals is extremely interesting in this connection. (See also Arthur Thomson: "The Gross Anatomy of the Filtration Angle of the Human Eye." THE OPHTHALMOSCOPE, September, 1910); also the figures of Rochon-Duvigneaud as to the dimensions of the angle of the anterior chamber in man bear upon this point (THE OPHTHALMOSCOPE, October, 1913). His figures are as follows: between the upper end of the vertical axes of the cornea and the angle of the anterior chamber, the angle of the anterior chamber extends 2·25 mm. between the lower end of the vertical axis and the angle of the chamber 2 mm., and between the nasal or temporal end of the horizontal axis and the angle of the chamber 1·25 mm. Manifestly the upper angle of the chamber is most accessible. Descemet's membrane must be cut through if possible, and we believe this is much more likely to occur if a mechanically operated rapidly rotating trephine is used than if a hand trephine is employed.

The tenth lesson is that a 2 mm. trephining has proved more serviceable than a 1½ mm. one. This is contrary to Elliot's large experience, but we hold to our own conclusion for the present, feeling that an iridectomy can be much better performed through a 2 mm. than through a 1½ mm. opening. Moreover, if the scleral disc sticks, it is much easier to disengage a 2 mm. disc with the forceps and scissors than a 1½ mm. disc, and there is less likelihood of leaving some scleral tissue in this opening.

The eleventh and final lesson is that intra-ocular hæmorrhage will occur in a certain percentage of cases, seeing that the glaucomatous eye is almost always a vascularly degenerated eye. In the presence of trephining this is an almost negligible factor, so far as the integrity of the eyeball is concerned, a claim that even the most ardent advocate of iridectomy cannot advance for the operation.

It is therefore our feeling that sclero-corneal trephining (sclerostomy) has come to stay; that it is by all odds the safest operation for glaucoma in the hands of the neophyte; that if this postulate is correct, many more prophylactic operations for glaucoma may be done now than have been done in the past. And if this operation is the safest one in the hands of the operator of small experience, is it not reasonable to push the argument further, and hold that it is therefore the operation of greatest safety under the guidance of the operator of large and long experience? Time only can bring a just and full judgment of this latest method for the surgical control of glaucoma. Meanwhile let us heed the words of Paul to "think on these things" and to "prove all things," and "hold fast that which is good."

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[*The end.*]

CLINICAL MEMORANDA.

IRITIS ASSOCIATED WITH THE DIPLOBACILLUS (MORAX-AXENFELD).

BY
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THE case about to be described seems of sufficient interest to warrant record, even although there may be a certain element of speculation in the conclusion drawn:

W. A., aged 60 years, a labourer, came to the Glasgow Eye Infirmary, Charlotte Street, on February 20th, 1914. He had not been accustomed to have sore eyes. He was suffering from an acute type of conjunctivitis, with swollen, velvety conjunctiva, fairly profuse secretion, lacrimation, and a tendency to ectropion from the conjunctival swelling. The appearances raised a suspicion only of iritis as well. A smear preparation showed but a very few diplobacilli, so few that zinc was not employed in the treatment. When the patient returned a week later, there was practically no improvement in the conjunctival condition, and there was definite iritis. He continued as an outdoor patient, receiving atropine and protargol, but as the pupil refused to yield beyond a moderate degree, and the conjunctivitis did not cure, he was admitted indoor. Leeches to the temple, mercury inwardly, and atropine locally six times daily, caused only a moderate improvement and the pupil remained as it had been, *i.e.*, slightly dilated. The left conjunctiva became affected. Another smear was made from the conjunctiva and a culture tube inoculated, but, without waiting for the result, zinc sulphate drops, 4 grains to the ounce, were ordered. The effect of this was almost "magical." The conjunctivitis cleared up with great rapidity, but the effect on the iris was equally remarkable. From the commencement of the zinc treatment, the pupil began to yield, shamrock-fashion, and in a day or two the iritis had quieted down.

On examination of the smear, no diplobacilli were found, but the culture showed two characteristic pits and some half dozen points of (apparently) staphylococcus albus. A smear was made from one of the pits and from one of the white points close to it. It revealed plentiful diplobacilli and cocci. Exact investigation of the cocci was not carried through: at the end of a week the colonies remained white.

The conclusion that the iritis was dependent on the diplobacillus seems warranted by the remarkably positive effect of zinc treatment. It so happened that between the time of taking and examining the culture I read the following paragraph under the heading Bacteriology in the second volume of the *American Encyclopedia of Ophthalmology*, p. 794 :—

"According to observations by Bardelli, Axenfeld and Rymovitch, an iritis from absorption of toxins can be associated with a pneumococcal conjunctivitis, and that without any affection of the cornea. The following case leads me to believe that we may have Morax-Axenfeld conjunctivitis complicated in a similar way."

The description of the case, also in a man aged 60 years, tallies almost exactly in details with my own. The only essential difference seems to be that a direct smear showed *numerous* diplobacilli, no other organisms being mentioned either in connection with smear or culture. In my case the direct smear was once negative and once showed very few diplobacilli, while the culture revealed a coccus in addition. The cure of the iritis and conjunctivitis was equally rapid in both cases under the influence of zinc. There was no corneal ulceration in my case and none is mentioned in the case I have quoted.

Clinically, we are all aware that iritis may be associated with conjunctivitis, although no doubt the fact that iritis is present is sometimes not recognised, but the condition in the case just recorded and in the one quoted seems so definitely dependent on a specific organism that I have thought it worth while to draw special attention to the matter, even though the conclusion might be debated on the ground that the evidence is not complete.

A CASE OF INTRA-OCULAR HERNIA OF THE VITREOUS.

BY

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THE patient, an account of whose condition is here recorded, was in Hospital under the care of Dr. Odillo Maher, with whom I saw him, and by whose courtesy I am enabled to publish the following notes.

The patient, shortly before he presented himself, was struck on the left eye by a piece of wood. When first seen, the anterior chamber was full of blood, and the eye was much injected and tender. There was an abrasion of the cornea, but no rupture of the globe. Under treatment by iced compresses and atropine, the hyphæma cleared, but vision was only "hand-movements" and it looked as if there were a traumatic cataract.

On minute examination, however, a gelatinous transparent mass, oscillating freely with the movements of the eye, was seen overhanging the upper part of the lens, and projecting into the anterior chamber. The free edge of the mass had a bright red border, which was probably pigment derived from the blood in the chamber. The lens was *in situ*, and the fundus only very dimly seen through the cloudy lens, below the gelatinous body.

At first sight, a hernia of the vitreous in its hyaloid suggested itself to the writer as the most probable explanation ; but he was at that time unaware that any such condition had ever been recorded. This, too, would presuppose a luxation of the lens, and this the writer could not detect through the partially dilated pupil, although Dr. Maher considered that the iris was slightly tremulous.

On May 6th, four weeks after the accident, the R. vision was 6/6 ; and the R. tension (Schiötz) was 14 mm. Hg. The L.V. was fingers at a metre, and the L. tension was 23 mm. On May 9th, three days later, R. tension was still 14 mm., while L. tension was 28 mm., that is, there was commencing *plus* tension.

On reference to Collins and Mayou's "Pathology and Bacteriology" (1911), the condition here met with seemed to fit in fairly well with the description of an endothelial cyst. Treacher Collins says (page 171) "Intra-ocular cysts with an endothelial lining are met with in the iris. They have clear fluid contents and thin transparent walls. Clinically, they have much the same appearance as the epithelial implantation cysts of the iris, and they may, like them, form after an injury, although not necessarily a perforating one."

One could not ascertain whether the mass protruded from behind the iris, or arose from near its pupillary margin. At any rate, in view of all the circumstances, it was decided to operate. Dr. Maher made an eight millimetre incision with a narrow Graefe knife. The base of the iris immediately presented, was seized, and a small iridectomy made. Although the utmost gentleness had been used, vitreous at once escaped. The enveloping membrane, obviously the hyaloid, was not interfered with, but the eye closed. The condition was thus seen to have been a vitreous hernia.

At the end of a few days the eye was quiet, and in a week the tension of both was 14 mm., normal. The pupil responded to atropine and was widely dilated, and one could now see clearly that the lens was subluxated downwards and inwards. It had some fine opacities in it, and the vitreous was cloudy. The hyaloid had apparently retracted when its contents were liberated, as no trace of it could be made out in the anterior chamber.

The patient has returned to his home in the country, with instructions to return later should any trouble arise or if blindness ensues on the maturation of the cataract.

Remarks.

On searching literature further, one finds in Roemer's "Text-book of Ophthalmology," Vol. II, page 339, an accurate description of the condition of vitreous hernia. He says, referring to a case, "With Zeiss' loupe we may see something that looks like a clear transparent drop that hangs down from above into the anterior chamber and quivers with every movement of the eye. It is not a subluxated lens; that organ is in its normal place and position; it is a large prolapse of the vitreous into the anterior chamber. A rupture of the zonule must evidently precede the occurrence of this complication, but it cannot be demonstrated, as the lens is normally fixed. The vitreous in the anterior chamber is the cause of increased tension and should be removed."

In this case, as a direct result of the blow, the zonule must have ruptured at its upper and inner part, and the vitreous have become herniated in its hyaloid much in the same way as the gut in its peritoneum.

The condition certainly must be a rare one, and it is a knowledge of this circumstance that has prompted the writer to place the description on record.

HEREDITARY BLUE SCLEROTICS AND BRITTLE BONES.

BY

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RECENTLY I had the opportunity of examining a child supposed to be suffering from rickets, and at once noticed the blueness of the sclerotics. An enquiry into the family history elicited the fact that several other members exhibited this peculiarity, and that all had suffered from sprains and fractures of the bones.

The child, a girl, is aged one year and ten months. The sclerotics are a deep uniform blue colour; the fundi were not examined. She has never walked, and makes little attempt to stand. The hair is light in colour, and the teeth normal. Skiagrams of the legs and right arm show no evidence of old fractures, nor is there a history of any having occurred.

The middle of the shafts of the long bones show a normal amount of compact bone, but towards their extremities they appear to be more transparent than is usual at this age.

The epiphyses show no evidence of rickets. The child is smaller than her sister was at the same age.

The child's father, III (1) has blue sclerotics, and broke both legs at the age of sixteen. He has had many other injuries since, and in July, 1913, was thrown over the handlebars of his bicycle (an accident which seldom causes much damage) and broke one femur and several ribs. His sister, III (2), has blue sclerotics and has broken her ankle by slipping off the bottom step of a staircase. She has also sprained her ankle in the same way. They are both much smaller than any of their brothers and sisters, and are very thin: the man weighs only 7 st. 2 lbs. The other brothers and sisters are normal and have normal children. The grandfather, II (1), has blue sclerotics and brittle bones. He is very small and thin, weighing 7 st. 7 lbs., and has had innumerable accidents, having fractured at one time or another every long bone in the body, besides many ribs.

He has also had many sprained joints. His first fracture occurred when he was 15 or 16. His sister, II (4), is very small, and has sprained both wrists and both ankles without adequate cause. She has blue sclerotics. The great-grandfather I (1), was diminutive in size, had blue sclerotics, and suffered numerous sprains and fractures.

From this description it will be seen that the family agrees with those previously recorded, since the condition was first recognised by Eddowes in 1900, in that both sexes are affected and transmission only occurs directly through the affected members. Though blue sclerotics and brittle bones are the most obvious features, it is evident that they merely form part of a general condition. By the examination of an excised eye in an isolated example of the disease, it was shown that the blue sclerotics depended on an abnormal thinness of the fibrous tissue, the fibres, although normal in thickness, were very deficient in numbers (L. Buchanan).

The cornea in this case was very thin and the anterior elastic lamina entirely absent. This probably accounts for the astigmatism from which many of these people suffer.

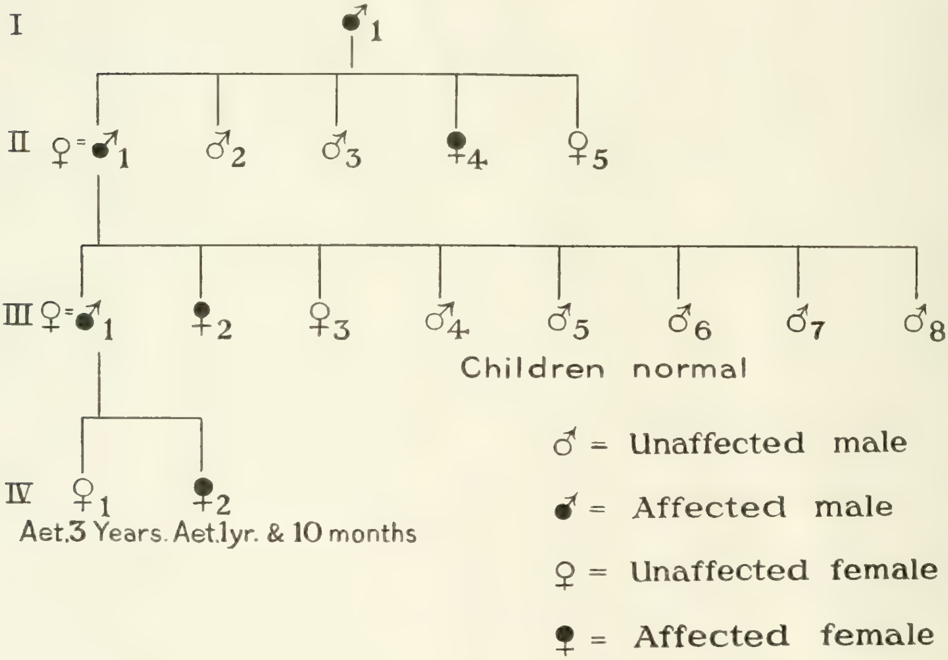
Bishop Harman has shown that the choroid is abnormally thin, giving rise to Fuchs' colobomata, with an oval appearance of the optic discs. The fractures are known to depend on a deficiency of the supporting framework of the bones. I think that considerable importance should be attached to the numerous sprains which have occurred in the family under consideration. Although possibly some of these were unrecognised fractures, it is highly improbable that all were injuries of this nature. It is more likely that all the fibrous structures round the joints are unduly thin and weak. The affected members of the family are all abnormally thin and light, two of the men weighing a little over 7 st. each, whereas the unaffected members are of average stature.

This also appears to be important, although I can find no reference to size in the reports of other families, except in that of Harman, who remarks on the small physique of his cases.

The defect is probably one of the whole of the mesoblastic tissues of the body.

Careful examination of all the tissues, especially of the muscles, ligaments, and fasciæ, are much needed to throw further light on the subject.

References are given below to the papers mentioned in the text, and to others which append a bibliography.



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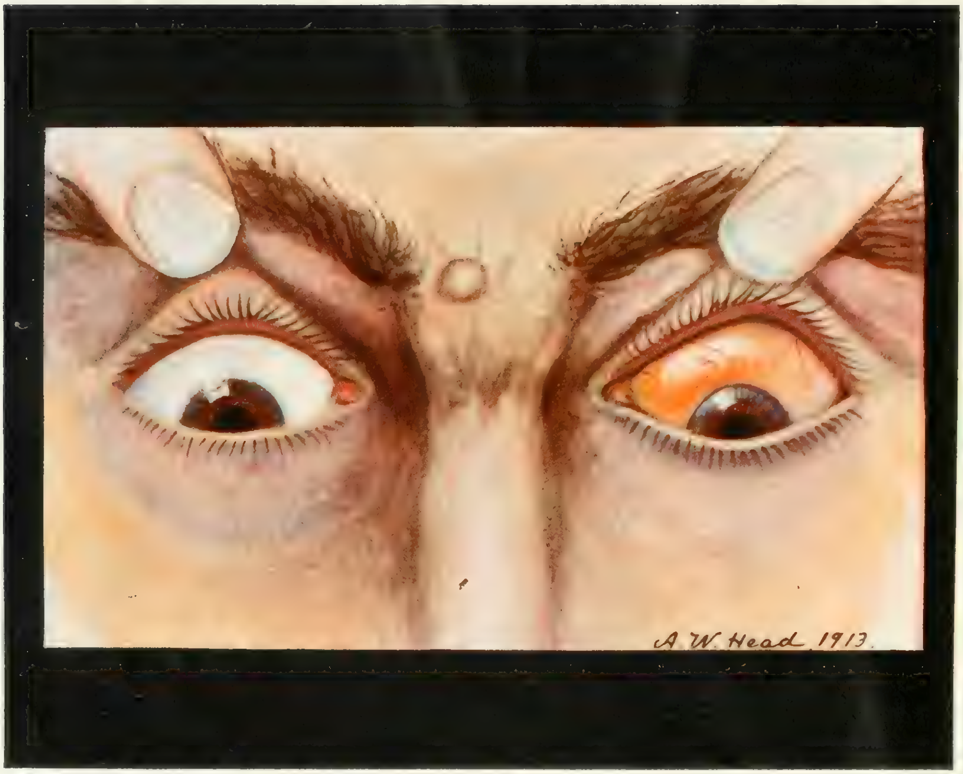

STEPHENSON: Case of Brawny Scleritis.

REVIEW.

BRAWNY SCLERITIS.

(Schlodtmann.)

BY

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Introduction.

AMONG rare diseases of the eye none is perhaps more striking than that first fully described from Fuchs' clinic by W. Schlodtmann[1] as " Brawny infiltration of the Conjunctiva and Sclera " in three patients, aged 64, 74, and 74 years respectively. The disease was bilateral in two instances. A few analogous cases had been mentioned before the appearance of this communication, as by Baumgarten,[2] Adolf Alt,[3] and Schirmer,[4] but it was reserved for Schlodtmann to characterise the disease as a clinical and pathological entity, and to bestow upon it the name of " Brawny Scleritis."

The malady has also been spoken of as " Annular Scleritis " and as " Gelatinous Scleritis."

Case.

Jonathan, M., 76 years, carman. The patient was first seen on May 28th, 1913, on account of the left eye having been inflamed for three weeks, without pain, and without known cause.

Personal History.

The patient is the father of eight children, of whom seven survive and are said to enjoy good health. One child died at eight years from scarlet fever.

The patient has suffered more or less from "asthma" for thirty years. No history of rheumatism or gout. Patient is very deaf. No disease, illness, or accident beyond the asthma mentioned above.

Patient has never had anything amiss with his eyes until the present attack of inflammation.

Present State.

L.E. above the horizontal meridan of the globe, the ocular conjunctiva is of a peculiar brownish-red hue, chemotic, and pervaded by a certain number of dilated conjunctival vessels. The swelling is not tender. There is no secretion from the eye, which manifests no particular intolerance to light. T.n. V. 3/24. A provisional diagnosis of Tenonitis was made.

The few teeth that remain are in a shocking state, but the patient cannot be persuaded to part with them.

Treatment and Progress.

Boric lotion to the eye, and aspirin (grs. xx daily), by the mouth.

June 4th, 1913.—L.E. slight straggling redness, having a very faint brownish-red tinge, now present below the horizontal meridian of the glode. Above that line there is a peculiar-looking chemosis (pervaded by conjunctival vessels), which shows a slight tendency to overlap the edge of the cornea. The chemotic condition extends out of sight to the equator of the eye, but does not seem to go much beyond that point. Trivial tenderness of the parts, and some slight pain on movements of the eyeball. Aspirin increased to grs. xxx a day.

June 25th, 1913.—Potassium iodide, grs. xv a day.

July 9th, 1913.—L.E. ocular conjunctiva somewhat reddish, but not œdematous as regards its lower half, which contains some dilated conjunctival blood vessels. Upper half of the ocular conjunctiva in a state of smooth chemosis, and a little tender to the touch. The swelling does not appear to go beyond the equator, although it is difficult to be certain as to the point, since the eyes are deeply placed and are consequently not easy to examine. But it can be seen that the chemosis is least pronounced in the upper temporal quadrant of the eyeball. Fundus normal. No keratitic deposits. There are some slight peripheral opacities of the cornea. No pain. The general health is good.

July 24th, 1913.—Eye sketched on this date (*see* plate).

August 20th, 1913.—General health unaffected. Patient complains of no pain in the eye. L.E. brownish-red chemosis, with dilated conjunctival vessels, above horizontal meridian of the eyeball, while below that landmark the ocular conjunctiva has a slight brownish-red discolouration, and is pervaded by several dilated conjunctival vessels, although there is no actual chemosis.

September 10th, 1913.—Changes still limited practically to the upper segment of the left eye. The thickening is now more "brawny" in appearance than it was. It pits slightly on pressure. No pain.

October 20th, 1913.—L.E. patchy sclerosing keratitis around cornea, less marked (curiously enough) above than elsewhere.

The Wassermann reaction was found to be negative.

November 5th, 1913.—Patient exhibited before the Section of Ophthalmology of the Royal Society of Medicine (*see p.* 312 of the present issue of THE OPHTHALMOSCOPE.)

Pathological Examination.

On November 12th, 1913, a piece of the infiltrated conjunctiva and subjacent tissue was removed from the upper part of the globe. The exposed sclera, it was observed, was white and free from obvious naked-eye signs of inflammation.

The material was divided into two pieces, of which one was placed in formol (10 per cent.) and the other in Zenker's fluid. A careful search for spirochætes, made independently both by myself and by Dr. A. W. G. Woodforde in the formol-hardened tissue, was negative. The specimen treated by Zenker's fluid was embedded in paraffin and cut for the microscope. Sections showed that the tissues were infiltrated with plasmocytes and polymorphonuclear leucocytes, and were extremely vascular.

April 22nd, 1914.—Condition of eye practically unaltered.

Remarks.

Brawny Scleritis is essentially a disease of middle life or old age, and affects men more often than women (Komoto). It runs an exceedingly chronic course, the even tenour of which is liable to be interrupted by exacerbations, as in Baumgarten's case, where attacks of pain, photophobia, lacrymation, and redness lasting for some twelve hours at a time came on about every month. Gilbert's case[5] seems to be quite exceptional, since its course was very rapid, only a few weeks elapsing from the onset of the disease to removal of the affected eye.

That such eyes are only too often lost, although not from Brawny Scleritis pure and simple, is shown by the fact that pathological reports of the condition are relatively numerous. More than one of the affected eyes has been removed under the idea that it contained a new growth.

To judge from the few published cases, the clinical appearances and the course of the disease are, however, sufficiently distinctive.—A middle-aged or elderly patient, without known cause, is found to present a painless inflammation of the anterior segment of the globe, which usually affects both eyes, although not necessarily at the same moment or to the same extent. At an early stage inflammation may involve one portion of the circumference and spare the others, as in Komoto's case and in the case related in the present communication. Under any circumstances, it does not extend beyond the curvilinear line which marks the attachment of the recti tendons, possibly because the episcleral tissue is very thin and relatively non-vascular behind that landmark. The gelatinous and succulent infiltration, which in my case pitted slightly on pressure, is diffuse, and has a curious reddish-brown hue, which once seen is scarcely likely to be mistaken for any other condition. It is important to note that this form of Scleritis is not usually accompanied by nodulations, such as are common in ordinary Scleritis. When such are present, they show distinctive features. It is only when the infiltration involves the insertion of one or more of the recti tendons, as in cases by Oatman,[6] Komoto,[7] and Verhoeff,[8] that a kind of nodulation is the result. Even then its origin would be more than merely suggested by its anatomical position and its square outline. Verhoeff thinks there is some reason for believing that "the essential process in the sclera begins at the insertions of one or more of the recti tendons, and from there involves the episclera in a chronic inflammatory reaction, and then penetrates the sclera and involves the uvea." In my own case, which was seen within three weeks of the commencement of the inflammation, and watched for many months, nothing of the kind was seen, though watched for.

In Oatman's case,[6] the patient, a man aged 54 years, presented in one eye the unusual feature of a staphyloma on the temporal side of the sclera. A severe blow upon the affected eyeball set up intense pain, and the globe and the staphyloma became soft and fluctuating. After enucleation, it was found that the staphyloma was constituted by an ectasia of the sclera, in conjunction with a dense cellular deposit involving the tendon of the external rectus muscle at its insertion into the sclera. The sclera was completely ruptured at that place, thereby accounting for the flaccidity of the globe noted after the injury to the eye.

In the further course of the disease, the infiltration spreads into the cornea, probably through the ligamentum pectinatum, where it takes the form of a so-called "Sclerosing Keratitis." The anterior segment of the uveal tract becomes compromised, although usually not until late in the history of the case. This renders it extremely probable, as surmised by Baumgarten, Uhthoff, Parsons, Komoto, and others, that the affection of the uveal tract is secondary to the Scleritis. In Verhoeff's case, indeed, the fact that the sclera showed marked tissue proliferation, whereas the episclera and uvea showed chiefly plasma cell infiltration, is almost enough to prove that the scleral process was the primary and essential factor in the symptom-complex. Clinically, implication of the anterior part of the uveal tract is shown by sclerosing keratitis, keratitis punctata, posterior synechiæ, occlusion of the pupil, vitreous opacities, and lowered tension.

In Baumgarten's case,[2] spontaneous cure of the disease took place in one eye, while the other continued to run its destructive course. In Schlodtmann's first case,[1] the same thing took place.

Several of the eyes in which Brawny Scleritis was found on pathological examination were removed on account of increased tension which in some instances at all events, had nothing to do with the scleritis. One, that of Verhoeff,[8] was taken away because of the possibility of the eye containing a tumour.

Several eyeballs affected with Brawny Scleritis have now been examined with the microscope.

In the earliest case of which we have a pathological record, that of P. Baumgarten,[2] the vessels of the conjunctiva and episclera were found to be dilated and filled with blood and the tissues infiltrated with round cells. The anterior parts of the sclera had attained a thickness of 4 mm. (normal thickness immediately in front of the insertion of the recti tendons, 0·6 mm.), and the fibres of the sclera were infiltrated with round cells, which had accumulated in places as almost to resemble so many small abscesses. The cornea was also more or less infiltrated. In Alt's case,[3] which was described as one of "purulent scleritis," the sclera was five or six times thicker than normal, and this was found to be due to the immense number of round cells that lay between its fibres. The fibres, which were pressed far apart by the exudation, were not necrotic.

Schlodtmann[1] found a colossal cellular infiltration of the limbus all around the eye with mononuclear and, to a less extent, with polynuclear cells. The infiltration, which included necrotic foci, had spread to the sclera, some of the fibres of which had been destroyed. Giant cells were extremely numerous, and were not limited to the necrotic foci. Infiltration was also present in the ciliary body, the supra-choroid, and inner scleral lamellæ. It was less marked in the iris. The gelatinous thickening of the conjunctiva was due to pronounced distension of the lymph- and blood-vessels, so that in places an appearance as of a cavernous tissue was present beneath the epithelium. Schlodtmann believed that the affection was microbic, although he failed to demonstrate bacteria in any of his sections. In particular, no tubercle bacilli were found. For that matter, indeed, no reaction followed inoculation of a rabbit's eye with a piece of affected conjunctiva. Syphilis was excluded as a cause, since neither objective examination nor histological observation pointed in that direction, to say nothing of the history of the case.

In a woman, aged 67 years, who had suffered for several years from relapsing scleritis, uveitis, and sclerosis of the cornea of one eye, O. Schirmer[4] found the episclera distended with enlarged blood- and lymph-vessels, along with hæmorrhages, and the tissue œdematous, and containing round cells, especially immediately beneath the epithelium and in its deeper layers. The fibres of the sclera were pressed apart by cellular infiltration. The cornea was infiltrated with round cells. The iris and ciliary muscle and anterior parts of the choroid were hypernucleated.

Franz Friedland[9] examined pathologically the eyes of two patients, aged 72 and 75 years respectively, where enucleation was necessitated by pain, after sight had been almost destroyed by uveitis and glaucoma secondary to Brawny Scleritis. The anterior segment of the sclera and choroid was infiltrated with heaped-up mononuclear round cells, and there was a tendency to necrosis of both structures. The episclera was also affected by the infiltration, which had spread to the cornea. There were no pus cells. Giant cells were not numerous. There was no caseation, neither were there epithelioid cells, bacilli, nor tubercle-systems.

Uhthoff,[10] again, found that the essential changes were confined to the anterior part of an eyeball he had removed from a man of 75 years. The globe showed a scleral and intercalary staphyloma on one side. The sclera, and especially the episcleral tissue, were densely infiltrated with small mononuclear leucocytes and pervaded with vessels of new formation. The sclera was in places broken through and destroyed by the infiltration. There were no giant cells, except in the external layers of the markedly thickened choroid, which was affected secondarily. The cornea showed pathological changes only in its peripheral parts. Yellowish-grey nodules, visible clinically, were found pathologically to present certain analogies with trachoma follicles. Around a centre of large endothelial cells was grouped a mantle, as it were, of deeply-staining mononuclear leucocytes. Uhthoff was inclined to believe that these curious nodules resulted from blocking of the capillaries by the pressure of the mononuclear cells, followed by the proliferation of endothelium of the vessels. Micro-organisms could not be demonstrated. Uhthoff laid stress upon the vascular changes (proliferation, hyaline thrombosis, arteriosclerosis, and endarteritis), and he regarded the obstruction thereby brought about as forming an important factor in the production of the disease.

In Parsons' specimen, obtained from a woman of 68 years, whose left eye was affected, among other lesions, with Annular Scleritis, it was found that the upper part of the sclera was attenuated, being reduced to about half a dozen intact lamellæ. The remaining lamellæ were separated from one another, and partly destroyed by an infiltration of mononuclear leucocytes. Some polymorphonuclear cells were found near the dilated and proliferated blood-vessels, particularly in the episclera. The infiltration was diffuse. There were no nodules or giant cells. Endarteritis, although present, was not a marked feature in the specimens. Parsons surmised that the nature of the leucocytes present pointed to a specific inflammatory process of an extremely chronic nature. He further made the suggestion that the backward extension of the disease process, which appeared to be limited by the line of exit of the venæ vorticosæ, might possibly be due to the better nutrition of the sclera behind the equator of the globe.

E. L. Oatman[6] found changes in the nerves distributed to the diseased zone of sclera, and on the strength of that observation, suggested that the inflammation might be dependent upon a reflex or trophic disturbance.*

J. Komoto,[7] of Tokio, where the various forms of Scleritis appear to be unusually frequent, has published the account of a woman, aged 47 years, affected with a curious form of deep Scleritis. Enucleation was rendered necessary on account of pain. On naked-eye examination of the globe, the sclera was found to be diffusely thickened (10 mm.), but the change extended beyond the equator and rose into a definite tumour, measuring 12 mm. by 7 mm., the posterior edge of which reached within 5 mm. of the entrance of the optic nerve. The retina was in place except over the scleritic tumour. The choroid and ciliary body were thickened, but the iris was relatively little affected. The case must therefore be regarded as atypical. With the microscope, the swelling of the sclera was found to be due to densely packed groups of round or oval mononuclear cells. No giant cells were found. The sclera showed no necrosis, possibly, as Komoto supposes, because the case was of recent origin. The infiltration in the subconjunctiva was dense, and vessels (blood and lymph) were so abundant as to justify the comparison with cavernous tissue, instituted by Schlodtmann, and endorsed by Uhthoff. Giant cells were infrequent. There were no hæmorrhages. The infiltration had found its way into the cornea beneath Bowman's membrane. The little nodules, described by Uhthoff as resembling trachoma follicles, were found here and there. Anything like tubercle-systems were absent. Komoto opposed the microbic theory of the origin of the malady.

Despite the fairly numerous pathological examinations of cases of Brawny Scleritis as set forth above, it is only recently that the anatomical changes can be said to have thrown any definite light upon the essential nature of the disease, and those observations still lack confirmation. Verhoeff[8] found that the chief changes consisted in an invasion of the sclera and recti tendons with granulation tissue rich in plasma cells, together with a diffuse infiltration of the ciliary body and anterior part of the choroid with plasma cells. The cornea was almost normal, and the iris was only slightly involved in the inflammatory process. It was, however, diffusely infiltrated with plasma cells. A few giant cells and areas of fatty degeneration, infiltrated with pus cells and endothelial phagocytes, were present, without definite caseation. Peri- and endarteritis were pronounced in the specimens. The anatomical changes suggested syphilis as the cause. Wassermann's test, moreover, yielded a positive reaction. At the same time spirochætes could not be found in tissues stained by Levaditi's method.

Although Schlodtmann definitely put aside tuberculosis and syphilis as causes of Brawny Scleritis, yet, as pointed out by Verhoeff, the histological findings in all the reported cases are suggestive of syphilis as the causal factor. His own work suggests strongly that the affection may, after all, be of syphilitic origin. That possibility will have to be taken into account in all future cases. The constant or almost constant presence of vascular changes in the disease, and its association, in some instances at all events, with a syphilitic diathesis, make it possible that the scleral and episcleral changes are dependent upon syphilitic disease of the blood-vessels of the parts in question.

At the same time, in my own case and in the one reported recently by J. B. Lawford[13], the Wassermann reaction yielded a negative result.

W. Gilbert,[5] who described an unusually acute case of Brawny Scleritis in one eye of a woman, aged 76 years, only the other day, endeavoured to bring the pathological appearances of the case into line with those that characterise gout. The patient suffered from gouty deposits in the finger joints and metatarsus. On these several grounds the Scleritis was regarded by Gilbert as a gouty manifestation.

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* He is not now of the same mind (Verhoeff[8]).

The most recent histological report, by R. A. Greeves, deals with a piece of swollen tissue excised from a case of unilateral Brawny Scleritis in a male patient, aged 70 years, under the care of J. B. Lawford.[13] The tissues, which contained a large number of thin-walled blood-vessels, were infiltrated with plasma cells, lymphocytes, and polymorphonuclear cells. In some parts of the sections examined the former predominated, and in others the polymorphonuclear cells New fibrous tissue was in process of formation throughout. Neither follicles nor nodules were present.

Diagnosis.

The recognition of an advanced case of Annular Scleritis should offer little practical difficulty. The age of the patient, the bilaterality and insidiousness of the disease, together with its slow but destructive course, the fact that it affects only a girdle-like zone around the cornea, and the gelatinous thickening and reddish-brown colour of the diffuse diseased zone impart very special characteristics to the symptom-complex of this curious malady. Atypical cases, such as the one described in the present communication, may be confused with other conditions, especially at an early stage. Indeed, in the discussion of my case at the Section of Ophthalmology of the Royal Society of Medicine, one speaker suggested that it might be an instance of and another that it represented a sarcoma which had originated inside the Tenonitis, globe and had perforated.

The inflammation might be confused with a *Gumma of the Sclera*, although a gumma is almost as rare as Brawny Scleritis, and not much more is known of the one condition than of the other. Still, a typical gumma would form a more or less well-defined and elevated growth, involving a portion only of the circumcorneal sclera ; it would not last for months or years, as does Brawny Scleritis, without ulcerating and breaking-down ; it would disappear quickly under specific treatment ; and, finally, it would be just as likely to occur in the young or middle-aged as in the old.

Confusion with a condition described by Donald Gunn[14] in 1893, would be much more likely, as pointed out by nearly every writer on the subject. The disease, which probably represents a diffuse gummatous infiltration of the conjunctiva and episclera, was met with by Gunn in three young subjects, the eldest of whom was aged 26 years. It involved one eye alone. It was characterised by the existence of a zone of raised, semi-translucent, and swollen conjunctiva, of a pink or red hue, surrounding the cornea, and extending backwards about as far as the insertion of the recti tendons. The eye changes were in each case associated with secondary manifestations of syphilis. A similar condition has been mentioned by several other writers, as A. Bronner,[15] Elschnig,[16] and Kalt.[17] The main points of distinction would seem to be the youth of the patients, the unilaterality and sub-acute course of the affection, its association with obvious syphilitic manifestations, and its ready response to specific remedies.

With Posterior scleritis, cases of which have been examined microscopically by Wagenmann[18] and Coats,[19] confusion is scarcely likely to occur, although with intermediate cases, such as that of Komoto[7] and of J. Jameson Evans,[20] there might be difficulty. It is indeed possible that Anterior Scleritis differs from Posterior Scleritis only by its location.

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NOVELTIES.

A SCOTOMETER.

BY

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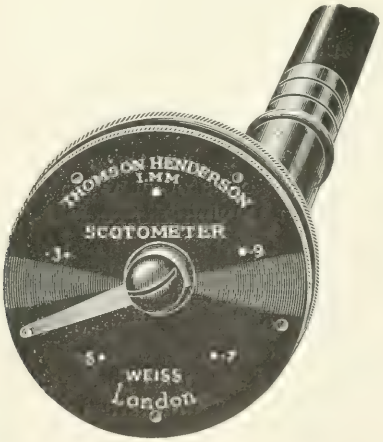
This instrument, made for me by Messrs. Weiss, and shown at the last Oxford Congress, makes the detection of a contracted field of vision or of a scotoma, whether absolute or relative, a very simple matter.



Instead of reflected daylight, this instrument is illuminated by the transmitted electric light of the handle of the Morton-Inskeep ophthalmoscope. The source of illumination is thus constant.

As the accompanying illustration shows, the scotometer consists of two superimposed discs, the front one having five apertures in it, graduated from 1 mm. down to 0·3 mm. The posterior disc carries one plain and four coloured glasses, red, green, blue, and orange.

The two discs can be rotated independently by their milled edges, so as to vary the size of the aperture or the colour presented to the patient.

The simplest method of examination for a scotoma or contracted field is made in the dark room with a dim diffuse light, just sufficient for the patient to see and fix the observer's eye at a little over half a metre. The small beam of light from the instrument is then thrown on the patient's eye and moved round the field of vision.

The procedure is, in fact, similar to that of testing the field of vision by hand movement, but this method, while being equally simple, is far more accurate and delicate.

To chart the field I use the Maddox Vertical and Horizontal Tangent (1 metre) Scale mounted with a small point of light fixed at zero as a fixation point. An extra " lead " from the accumulator of the ophthalmoscope handle supplies the light to the fixation point.

The principle is, of course, that of Bjerrum's test, but simpler, while the object presented to the patient is smaller.

TRANSLATION.

THE BONY EYE (L'ŒIL OSSEUX.)*

BY

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OSSIFICATIONS of the human eye, pathological in character, and of varying origin, site, nature, and evolution have been described.

Those which are of teratological origin, which result from anomalous development of the crystalline lens and of the optic cup, are among the rarities. They develop under the conjunctiva in the form of little tumours of benign character, and are called osteomata of the conjunctiva.

Others, but still more rare, are also situate under the conjunctiva : they are inflammatory in origin, and are mainly the result of trachoma. Here they represent a transformation into bone of new-formed connective tissue. They are accompanied by hyaline or amyloid degeneration. This is called ossifying conjunctivitis.

With regard to the choroid, ossifications dependent upon a neoplasm, true osteoid sarcomata, have been described. But the observations, by means of which this anatomico-clinical type of intra-ocular ossification has been created, ought to be interpreted otherwise. As a rule, they refer to old-standing inflammatory ossifications of the eye, upon which a sarcoma has become grafted. One finds, in fact, inflammatory ossifications of the choroid complicated secondarily by sarcoma, but there does not seem to be authority for describing an osteoid sarcoma of the choroid.

Lastly, in the interior of atrophic stumps inflammatory osseous new-formations are frequently found.

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* *Revue Générale d'Ophtalmologie*, 31 janvier, 1914.

Similar new-formations have been seen in the lung, in the thyroid, in the pleura, in the muscles, and in the brain ; but even if it is possible to see bony new-formations taking place under the influence of inflammation in a great number of organs (such, indeed, is only a general property of connective tissue), still, this tendency to bone formation is by no means as common or as constant as in the membranes and media of the eye. These bony formations which, everywhere else, are clinical or anatomico-pathological findings of purely academic interest (*d'un intérêt uniquement documentaire*) constitute an actual disease of themselves in ocular pathology. They ought to have a separate place in the nosological classification. They are a syndrome ; they have a symptomatology, an evolution of their own, and complications. They admit of proof. They demand treatment. In one word, the osseous eye has a clinical and pathogenetic individuality.

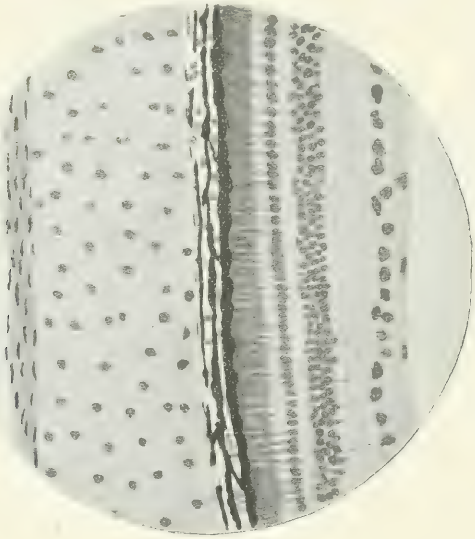

FIG. 1.

Section of the coats of the eye of a frog, showing the choroid acting as a periosteum.

It seems as if ophthalmological literature fails to give this syndrome a proper place. There are innumerable articles on the subject, but most often they resolve themselves into the publication of a few isolated facts. In the service of Professor Rollet I have endeavoured to fill this gap. It is a very large subject, and it has been dealt with elsewhere in full.* It is only possible here to give a short summary.

Ossifications in the eye represent the final transformation of inflammatory exudates which have their origin in the membranes and media of the eye, as the result of infections. These exudates first become organised into fibrous tissue and become vascularised. Certain cells of the exudate, of lymphocytic origin, become differentiated into osteoblasts, secrete ossein and make primitive bone. This, after it has been remodelled by the vessels, eventually becomes definite Haversian bone.

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* In the author's *Thèse de Lyon*, 1913.

The reason for the frequent occurrence of bony new-formations in the choroid is that this membrane acts in many animal species as a true periosteum.

For the very reason that exudates may occur in any part of the eye, ossifications may be met with in all the membranes and in all the media. They are very rare in the iris, in the cornea, and in the retina ; more common in the vitreous and in the lens, and still more common in the choroid, which is their seat of election.

In the vitreous, ossification derives its characteristics from the topography of the medium in which it developes. It is in the position of the canal of Stilling, in the post-lenticular space of Berger, and also between the retina and the vitreous that inflammatory exudates become organised and ossified.

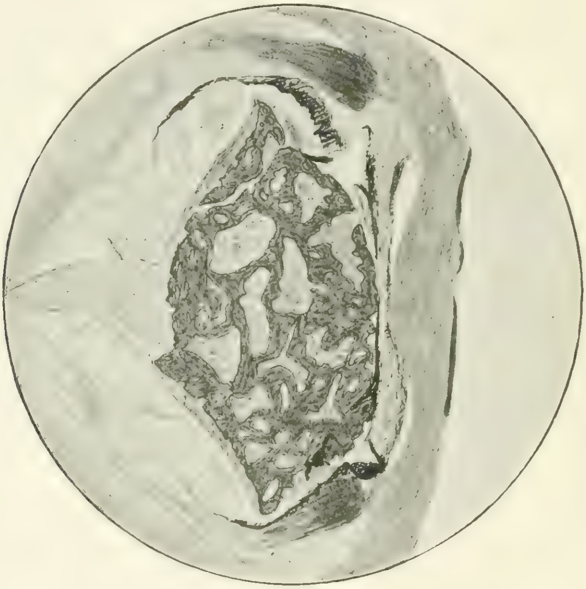

FIG. 2.

Total ossification of the lens. The lens has preserved its shape and size.

There are more than forty cases published in which the lens was ossified, but most often such ossification has been merely a localised manifestation of an ossifying process in the eye as a whole. In ossification of the lens the shape and size of the organ are reproduced. The bone is formed of trabeculæ which are thicker and wider and denser than those forming choroidal bone. It is often quite isolated from ossifications of the neighbouring tissues.

In the choroid bone formation is very common. It is even more exact to say that in the osseous eye the choroid always participates in the bone formation. All the varieties can be reduced to one or other of the six anatomical forms which we have isolated and described, and of which the schematic representation figured below (Fig. 3) gives a sufficiently good idea.

Most often the bony new-formation is represented by a segment of an irregular sphere, which has a wide orifice in front, a narrow orifice behind, a smooth external surface, and an internal surface which bristles with spicules and roughnesses : this is the *cup-shaped total form* (*forme totale en cupule*).

Frequently also this cup-shaped new-formation, instead of being entirely bony, is formed of a series of little plaques of bone developed in the midst of a band of fibrous tissue. This is the *disseminate form.*

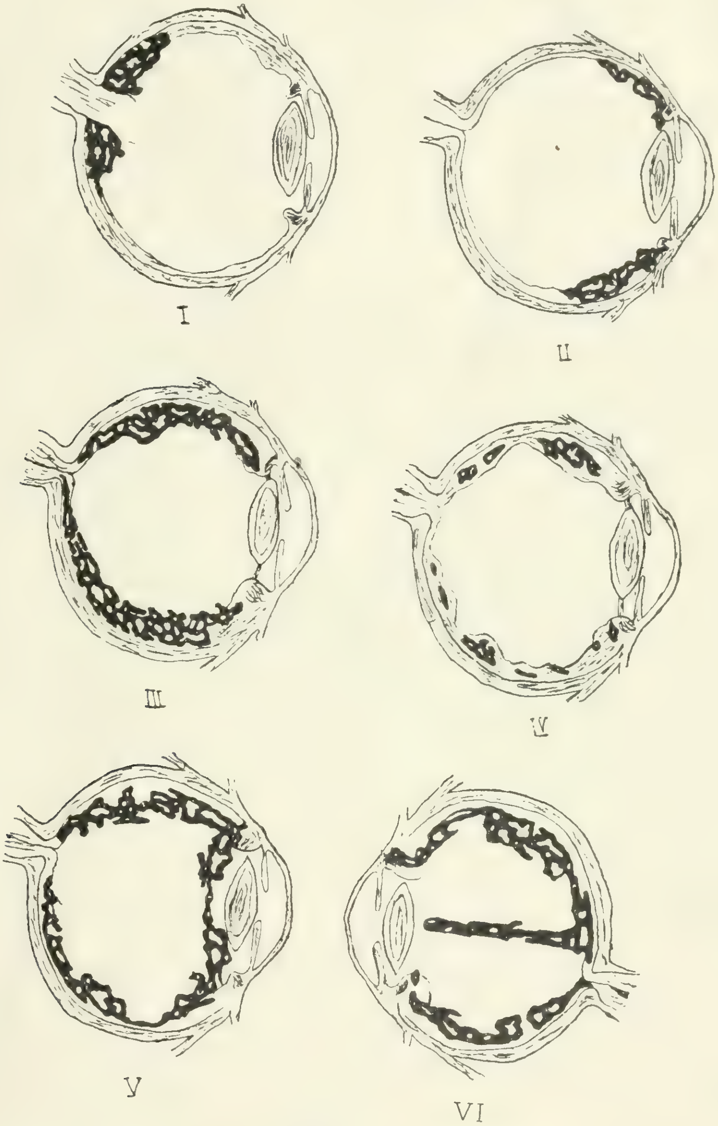

Fig. 3.

I. The annular perioptic form. II. The anterior annular form. III. The cup-shaped total form. IV. The disseminated form. V and VI. Complicated forms.

Sometimes the ossification is arranged in a more or less thick band around the papilla, or behind the ciliary body, and then we have respectively the *perioptic annular form* or the *anterior annular form.*

Lastly, sometimes choroidal ossifications push out at certain points well-marked prolongations which modify the topographical characteristics of the lesion. These are *complicated forms.*

The ætiology of inflammatory ossification is purely that of an infection due to a penetrating wound of the globe, to a spontaneous ulceration, or to a metastasis.

It is possible for bony new-formations to appear at a very early stage (barely three months) after the causative infection. They may either increase indefinitely up to the time when one is obliged to interfere, may remain stationary, or, in some cases, may become absorbed.

For the visual future of the patient they are a grave and constant source of danger. Indeed, one must recognise as a fact that intra-ocular bony new-formations of inflammatory origin, whatever their site, their size, their shape, or their stage of evolution may be, are always liable to cause a sympathetic ophthalmia, and, as a matter of fact, often do so.

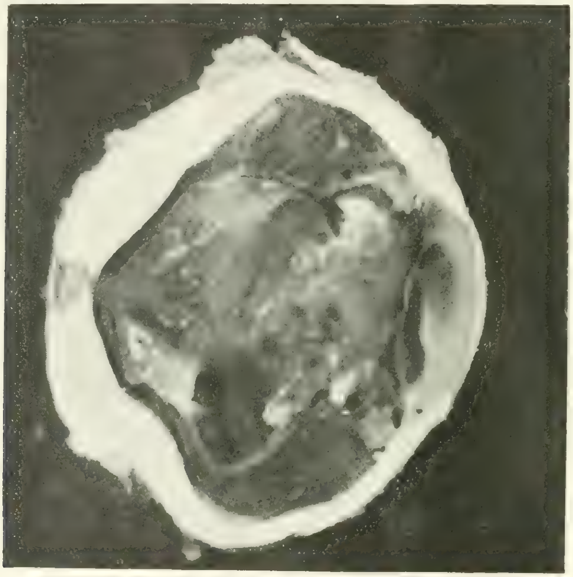

FIG. 4.

Photograph (enlarged three times) of ossification of the choroid.

Thus we come to the only rational therapeutic method. The bony eye is always useless, often troublesome and painful, and sometimes dangerous. It should be excised as soon as the diagnosis has been made.

But it is often difficult to make this diagnosis with certainty. When dealing with a painful stump, one may think of bone in the eye; but it is very rarely possible to feel, by palpation alone, the hard *plaques* in the eyeball which reveal the presence of bone in the interior, and, in many cases one would hesitate if one did not possess, thanks to radiography, a means of being certain about it.

We all know the service rendered by the X-rays in the diagnosis and localization of ocular foreign bodies. Professor Rollet conceived the idea that the Röntgen rays ought to be able to render similar services in the diagnosis of ossifications, and he carried out the first radiography *in vivo* of a bony eye. This radiograph of itself allowed of the positive diagnosis of ossification, a diagnosis which was histologically proved. We reproduce the radiograph of this eye, after it had been removed, and a photograph of its antero-posterior section in the same position.

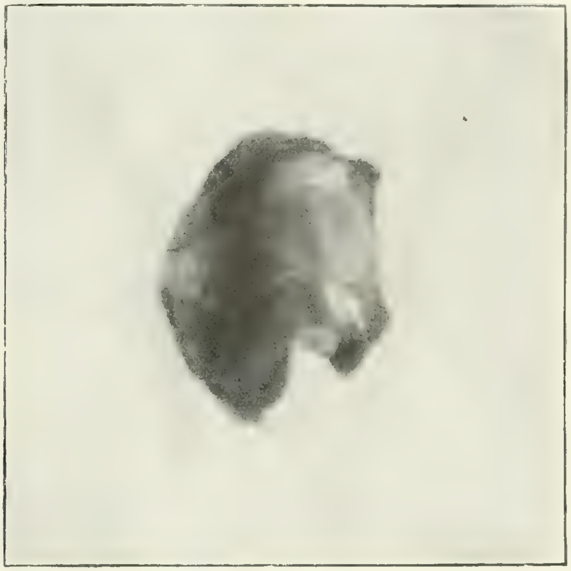

FIG. 5.

Radiogram (enlarged three times) of the ossification shown in Fig. 4.

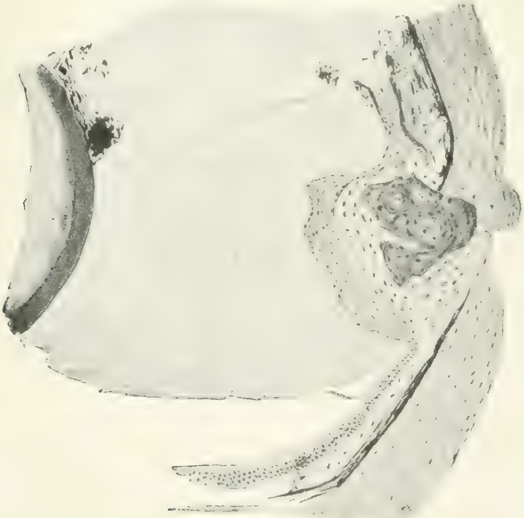

FIG. 6.

Experimental ossification. An osseous graft in process of development in the choroid of a rabbit.

In order that useful information may be obtained, it is advisable that radiographs of the supposed bony eye should be carried out in the temporal position. It is necessary to radiograph the two eyes successively under the same conditions, and to compare the two results thus obtained. If one be content with only one radiograph, the differences which exist in the structure and density of the orbital wall in different subjects may lead to error.

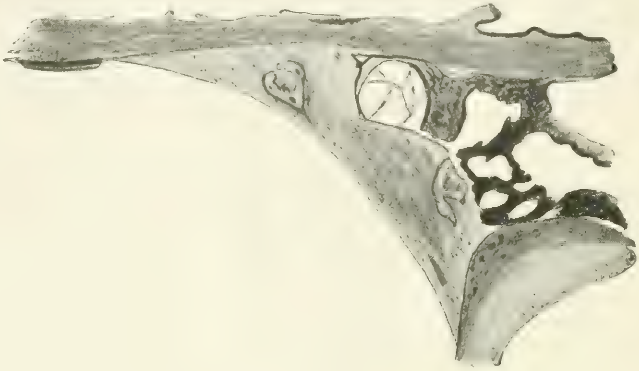

FIG. 7.

Experimental ossification. Osseous graft in process of development (*émaniement*) in the choroid of the rabbit.

The eye evidently forms a favourable medium for the process of ossification. Grafting of bone into the choroid easily gives positive results (Figs. 6 and 7). On the other hand, it is difficult to reproduce in animals inflammatory ossification processes of the eye analogous to those met with in man. Chronic irritations caused by aseptic injections of inert powders into the vitreous, inoculation infections by means of micro-organisms of attenuated virulence, of moulds, of tubercle bacilli, &c., have not, in our hands, resulted in the formation of bone in the midst of intra-ocular exudates.

ERNEST THOMSON.

CURRENT LITERATURE.

NOTE.—Communications of which the titles only are given either contain nothing new or else do not lend themselves to abstract.

I.—LIGHT SENSE IN ANIMALS.

(1) **Hess, C.—A new method of investigating the light sense of crustaceans. (Eine neue Methode zur Untersuchung des Lichtsinnes bei Krebsen.)** *Arch. f. vergleich. Ophth.*, Bd. IV, S. 52, Januar, 1914.

(2) **Freytag, G.—Researches on the light sense in animals. (Lichtsinnuntersuchungen bei Tieren.)** *Arch. f. vergleich. Ophth.*, Bd. IV., S. 68, Januar, 1914.

(1) In researches on the colour vision of the lower animals much ingenuity has been wasted in devising methods of experimentation which are useless or erroneous, because they do not take account of all the factors in the problem to be solved. Among the most important of these is the condition of adaptation of the animal under investigation. Daphnia, for instance, in a state of dark adaptation, swims towards the darker part of its aquarium, in a state of light adaptation, towards the lighter. It is easy to appreciate what errors the overlooking of this fact might introduce into researches on colour vision.

In the present paper **Hess**, of Munich, gives an account of a comparatively simple apparatus, not intended to replace more elaborate observations with the spectroscope and coloured glasses, but well suited to the easy demonstration of the main facts of colour vision in certain classes of animals. The water-flea, or Daphnia, is a convenient subject for experimentation. The animals are placed in an elongated aquarium facing a window, but protected from direct light by a black screen; the aquarium is then illuminated by light reflected from frames placed on each side at an angle of about 45°, and carrying white, black, or coloured papers.

In order to obtain dark adaptation, the aquarium is first covered with a cloth. When this is removed, the animals flock to the darkest part under shelter of the black screen. If a black paper be placed in one frame and a white in the other, they swim towards the black. They swim towards a red paper, rather than a blue or green, even when the former seems much brighter to our eyes. They show themselves very sensitive to small differences of illumination; if two similar papers are exhibited, and one is tilted even to a slight degree, so as to diminish the reflection, the animals at once swim over to that side. Observations with this apparatus fully confirm the results otherwise obtained, namely, that the crustacea behave towards colours like a totally colour blind man, and are therefore presumably totally colour blind.

In the second part of his paper, Hess replies to some animadversions which have been made on his methods and results by v. Frisch and Kupelwieser. These authors have come to the conclusion that Daphnia, and many other invertebrates, are not totally colour blind, but dichromic. They admit that bees do not distinguish red from black, or purple from blue, but think that yellow and blue are perceived. Somewhat illogically they nevertheless maintain that the colour of flowers is "for the sake of the insects." Of what use then, Hess asks, are red flowers? Their conclusions are founded chiefly on some experiments with Daphnia, which seemed to show an opposite influence of yellow and blue, yellow attracting the (dark adapted) animal, blue repelling it. They state that with a source of light of constant power, the interposition of a weak blue glass has the same effect as an increase of intensity in the light, while a dark blue glass has the same effect as a diminution. Hess, having repeated their experiments and varied them with his own apparatus, denies that the facts are as stated. He blames them for not having controlled their experiments with the spectroscope and sharply criticises their apparatus and methods. GEORGE COATS.

(2) The paper of **Freytag**, of Munich, is also devoted to an examination of some of v. Frisch's conclusions. Among the reasons which that author assigns for attributing a colour sense to fishes are the changes in tint which they undergo, for the purpose, as he supposes, of protective adaptation to their background. Some colours in the fish also seem to be purely decorative, and some are said to be especially brilliant at the breeding season.

The present research investigates the degree in which fish do, in fact, show a power of adaptation to their background. Minnows of different or similar shades of pigmentation were exposed to light reflected from black, white, or variously coloured surfaces. It was found that fishes taken from the aquarium under the same conditions of illumination and environment varied greatly in their colour and markings; that when dark and light animals were both exposed to a similar grey they showed no tendency to approximation; nor did either variety change colour in any regular manner; red markings did not become more prominent over a red background nor yellow over a yellow, and blue was equally without effect. In some cases the experiment was carried on for as long as twenty-four hours.

Freytag concludes therefore that fishes possess no specific power of colour adaptation to their environment. They show, however, a certain very limited amount of adaptation to its luminosity. The difficulty of obtaining accurate data is increased by the fact that causes other than luminosity and colour induce a change of tint in fishes—fear, for instance, and also, as is well known, the approach of death. On general grounds it might be supposed that protective colouring would be of little use at any considerable depth; and, moreover, protective imitation of the sea bottom would be useful only against enemies such as birds, which come from above, not against predatory fish, which may approach from any side.

We presume that Freytag does not totally deny the existence of protective colouring in fishes, but only their active power of adaptation to their environment. No one can watch a flounder settling on the sand without noting how perfectly it matches its surroundings. But of course this does not in the least prove that the flounder itself, or other fishes, perceives colours. In the struggle for existence it would be brought about if any habitual enemy—birds for instance—had good colour vision; and even in the case of colour blind enemies, it should be remembered that a close approximation of colour will frequently be associated with a close approximation of luminosity, to which colour blind animals appear to be very sensitive. GEORGE COATS.

II.—PAPILLOMATA OF THE LIMBUS AND CORNEA.

Contino.—New observations and investigations on papilloma of the limbus and cornea. (Neue Beobachtungen und Untersuchungen über die Papillome des Limbus und der Hornhaut.) *Archiv. für Augenheilkunde*, April, 1911.

This is an extensive paper, in which **Contino**, of Rome, gives particulars of eleven cases. These are described in detail and well illustrated. The literature dealing with the subject is passed in review, and the published cases are criticised.

Contino concludes that there are *two varieties* of limbo-corneal papillomata:

1. Small papillomata with massive proliferation of epethelium and small connective tissue papillæ. It is a benign tumour, small, well-defined, rarely lobulated. but its surface covered with small excrescences. There is usually hyperæmia of the surrounding conjunctiva. The condition is painless. As to diagnosis, there is some resemblance to pterygium and phlyctenule, and it may develop from the head of the former, as in two of his cases. The first seven of the cases described by Contino belonged to this group.

2. Papillomata where connective tissue proliferation is equal to that of the epithelium, when it does not exceed it. Three of the author's cases were of this

type. The surface was covered with large excrescences, like a cauliflower, its edges were ill-defined, gradually passing into the surrounding epithelium. There was little or no hyperæmia of the conjunctiva. These growths have the character of a true epithelioma.

One of his cases was a transitional form from one variety to the other.

Diagnosis in the early stage is very difficult to make from commencing epithelioma. An epithelioma is more fixed to the cornea, and tends to ulcerate, which a papilloma does not. Enlargement of the neighbouring lymphatic glands is of no value, as it is only a late sign when diagnosis is beyond question. He emphasizes the importance of thorough clinical and microscopical investigation. As to the *origin* of these growths.—Some believe that they are inflammatory, and due to an infective process. Contino points out that there is no evidence of this.

No round-celled infiltration could be found, except in one case, where there had been conjunctival catarrh. When there is hyperæmia, it is due to mechanical irritation of the growth. The symptoms and course are entirely against the inflammatory theory. Bacteriological examination was always negative. He believes that papilloma is a true new growth, which, starting in a benign way, may become malignant. Possibly, the cause may be a congenital anomaly of the cornea, or it may result from trauma, giving rise to irregular growth of tissue. The limbus in the ocular fissure is the spot usually affected, and external irritation may therefore be a factor, especially as the growth is met with in people who live out-of-doors, as farmers and labourers. Four cases only have been recorded in women.

Prognosis is favourable so far as preservation of the eye is concerned, if the growth is not too extensive, and does not invade the cornea too deeply.

Treatment consists of total excision of the growth, starting with the corneal part. After removal, the wound should be thoroughly treated with the thermo-cautery. The growth should be dissected off in the same way as a pterygium. If the cornea is so involved that sight is destroyed, the eye should be enucleated. Exenteration had to be performed in one of Contino's cases where there was recurrence. BEATSON HIRD.

III.—FERMENTS AND SYMPATHETIC OPHTHALMITIS.

Guillery, H.—About the effect of ferments on the eye, and their relation to sympathetic ophthalmia. (Ueber Fermentwirkungen am Auge und ihre Beziehungen zur sympathischen Ophthalmie.) *Archiv für Augenheilkunde*, Juli, 1913, S. 132.

Guillery, of Cologne, in this (his third) article, begins by reminding his readers that he has already proved that (1) by means of inoculating certain poisons into the rabbit's eye he has been able to set up a uveitis very similar to the sympathetic form, and (2) by such inoculations he has been able to set up an irritation even in the eye not inoculated. The state of irritation develops so quickly that in from one to one-and-a-half hours after the intravenous injection, there is seen in the upper part of the globe a vivid reddening, with occasionally small hæmorrhages. This is soon followed by definite pericorneal injection and redness of the lower part of the globe. This reaction follows with the certainty of a physical experiment, and has never been known to fail in dozens of trials. The height of the reaction is reached in from five to six hours, when there is often seen a distinct hyperæmia of the iris, narrowing of the pupil, with a perceptible exudation, and the vessels of the fundus are also seen to be enlarged. On the following day, there is a distinct reduction in the reaction, but slight traces of it can be observed for days. Sometimes with close observation, Guillery was able to note a diminution in tension after the onset of the reaction. He did not observe any changes in the vessels in other parts of the body, such as in the ear.

These injections affect healthy animals differently.

Prodigiosus Ferment.

An animal with normal fundi received in the ear vein 2 c.cm. of a prodigiosus ferment. After three-quarters of an hour, injection showed itself on the upper part of the globe, close to the tendon of the superior rectus, and soon developed into a large red band which extended as described above. The injection increased for one half-hour, when the pupils became so small that the fundus could hardly be seen. In the afternoon the injection was about the same, with numerous pin-point hæmorrhages about the upper corneal border. On the second day, the extravasation was a little diminished, but was still present on the fourth day. The animal received on the nineteenth day two intravenous injections with a similar result. On the thirty-second day a third, and on the forty-eighth day a fourth intravenous injection was given. After this last, there was immediately observed a vivid red injection above the two recti. One half-hour later, the injection was less, followed by an increase in the next half-hour. One hour later, the entire eyeball was injected, with marked pericorneal injection. On the following day the injection had disappeared.

On the fifty-fifth day a fifth intravenous injection of 2 c.cm. was given. Some minutes later the vivid reddening appeared. This increased and then diminished, while one and-a-half hours after the injection, it was again very marked. The animal was visibly weakened and apathetic. Or the sixty-second day a sixth injection was given. This was followed by a reaction, which diminished and increased as above.

On the day following the animal was killed, but, except a severe hyperæmia of the choroid and the sclera, nothing of a pathological nature could be found.

Subtilis Ferment.

In an adult animal, there were made repeated intra-ocular injections of about 0·4 c.cm. of a very active subtilis ferment in the right vitreous, after puncture of the anterior chamber.

The picture each time was that of a slowly developing and slowly disappearing inflammation. Repeated intravenous injections of an effective solution brought about a return of the inflammation in the typical form, without noticeable increase. The observations were carried on for three months. The eyeball became slowly smaller. Also in the left eye after the intravenous injections, the typical reddening of the eye and pericorneal injection appeared, although less than in the injected right eye. On the day after the fifth injection the animal was killed.

Findings.—*Left*, normal, except for hyperæmia of the retinal vessels.

Right, slight pericorneal injection, rich exudate of fibrin. Iris and ciliary body unchanged.

Choroid, especially in the equatorial regions, very thickly infiltrated. Capillary layer in some places entirely free. In the infiltrated areas many epithelial cells. Their origin from pigment cells could be distinctly followed. The retina was mostly changed into an atrophied string, which went obliquely through the vitreous. In some places lay a thin swelling on the choroid, which showed retinal remains and fresh round-celled spots. The vitreous was rich in fibrin, with single small spots of pigment and round cells also many plasma cells were present, but nowhere were pus cells found. The above shows, as far as such severe intraocular experiments can be possible, particularly the results of a pure form of these fermentations. The changes in the retina were mostly atrophic, from detachment, also the thin swelling formations on the surface of the choroid were a secondary finding, and must be looked upon as a result of the strong intra-ocular irritation.

The experimental order should be as follows: In one eye, through intra-ocular injection, an inflammation is caused. Before this entirely disappears, and at the irritation stage, another intravenous injection is made. In less than an hour an intense reaction begins. Then the entire eyeball becomes intensely red, as one sees it in only the most severe forms of intra-ocular inflammation. The iris changes colour, and is thickened by strong radial swellings. This stage develops in from four to five hours. It may be remarked in passing, that this appears from the time when the injection was made to the time when a so-called anaphylactic reaction should be expected. The reaction is not always so severe, but in an eye already diseased a stronger reaction is visible, even if the inflammation has entirely subsided. This fact is not without interest in another oft-mentioned question. If, in an already existing state of irritation, which, for example, a trauma has caused, does the eye show, by circulating impurities, a diminished resistance? That this question must be answered in the affirmative has been verified by experimental proof. Guillery gives the minute details of numerous other experiments with the pathological examinations. In his conclusion he says it is possible to call out through the intravenous injections of certain poisons a typical reaction in the eye with the certainty of a physical experiment. If the inflammation goes on to an iritis, infiltration of the whole uveal tract will be found microscopically, with the development of epithelioid cells. Guillery wishes specially to emphasize the fact that poisons circulating in the blood are able to set up a pathological picture which has, until now, been attributed to bacterial infection. Our next task will be to find out the origin of these poisons: whether they develop in the wounded eye or if any disease of the body is necessary for the development of this condition, *i.e.*, sympathetic ophthalmia. HANFORD MCKEE.

IV.—EYE CHANGES IN v. RECKLINGHAUSEN'S DISEASE.

Fehr, Oscar.—**A contribution to the eye changes in multiple neurofibromatosis. (Ein Beitrag zu den Augen-Veränderungen bei der sog. multiplen Neurofibromatose.)** *Centralbl. f. prak. Augenheilkunde*, September, 1913.

The nature of the so-called Recklinghausen's disease has been much discussed of late years, and **Fehr**, of Berlin, brings some cases to bear upon its elucidation. v. Recklinghausen believed the affection to be a pure fibromatosis arising in the endo- and perineurium, and therefore he termed the growths neuro-fibroma. Verocay held that the tissue of these tumours was not fibrous tissue, but a peculiar neurogenic tissue, produced either by the nerve fibre cells themselves or their corresponding embryonal cells, and suggested the name neurinoma. The affection is therefore to be regarded as a malformation or as a disease of nerves upon a congenital basis. Recently Wechselmann advanced a toxic theory to explain the affection. He noticed the frequent association of this disease with osteomalacic changes, and came to the conclusion that disease of glands with internal secretion, especially the pituitary, had something to do with this neurofibromatosis. There is at least a resemblance between this affection and some of the appearances in acromegaly and Addison's disease, and some of the visual disturbances in neurofibromatosis can be explained by changes in the pituitary.

The eye changes found depend upon the situation of the nerve changes, whether it be in the lids, the globe (ciliary nerves) causing buphthalmos, the orbit, or the interior of the skull. A unique case is that reported by Hirschberg in 1874 of a pericorneal tumour of this nature. It had been removed by A. von Graefe in 1865, but had recurred several times afterwards.

Fehr reports six cases, one with a postneuritic atrophy, one with retrogressive papillitis and some deepening of the sella Turcica, one case of severe elephantiasis of the face and lids. This case caused considerable operative difficulty in forming a movable eyelid, and at the same time bringing the palpebral fissure opposite the eye. Another case developed a thrombosis of one central vein, and in spite of a Krönlein operation, the site of the offending tumour could not be found. A. LEVY.

V.—DYSTROPHY OF THE CORNEA IN TABES.

Fuchs, Ernst.—**Dystrophia of the cornea in tabes. (Dystrophie der Hornhaut bei Tabes.)** *Centralbl. f. prak. Augenheilkunde*, August-September, 1913.

The peculiar condition in the cornea described by **Fuchs**, of Vienna, occurred in the following case, which Fuchs saw in 1911.—The patient, a man aged 20 years, in 1893 contracted a chancre; there were no secondary signs (patient observed by his brother, a doctor). In 1902 for three weeks he had inequality of the pupils and diplopia. From 1905 he had gastric crises. In February, 1911, he had œdema in both legs with a purpura-like exanthem, and soon after herpes zoster on the trunk. He now (1911) has "lightning pains" in the legs. Visual acuity began to fail in 1909. He now has some hypoæsthesia, and absence of patellar and Achilles reflexes. No Romberg nor ataxia—a peculiar looking ulcer on one leg, and a positive Wassermann.

Both pupils are dilated and show the Argyll Robertson phenomenon; the discs are white. The right eye can count fingers in the lower-inner quadrant. The left eye V.=5/18 with practically a temporal hemianopia. An *X*-ray photograph shows no alteration of the hypophysis region.

The corneæ of both eyes show in the lower quadrant (an area having its base at the limbus and its apex near the corneal centre) dull areas. This dulness is found to be due to innumerable fine spots which are not clear-cut, and are of a dirty-grey colour tending towards brown. These dots are more numerous in the lower part of the area, where they coalesce to form small *plaques.* They are not corneal precipitates of the ordinary type, but lie in the deepest layer of the cornea.

The clinical diagnosis is clearly tabes, and the optic atrophy is also to be looked upon as tabetic. The temporal hemianopia would be due to the tabetic atrophy being situated in the chiasma, and not, as is usual, in the optic nerves themselves

The corneal condition is to be regarded as a tabetic degeneration. One or two cases in the literature may have some bearing on this condition, but in no instance has anything exactly similar been reported. A. LEVY.

VI.—CONGENITAL ANOMALIES.

(*First Notice.*)

(1) **Tweedie, Hedley V.—Congenital pigment of the cornea.** *Ophthalmic Record*, March, 1911.

(2) **Hillion, H.—Deep physiological excavation of the papilla. (Vaste excavation physiologique de la papille.)** *Archives d'Ophtalmologie*, avril, 1911.

(3) **Armaignac.—Almost total congenital opacity of both corneæ in two children of the same family. (Opacite congénitale à peu près totale des deux cornées chez deux enfants de la même famille.).** *Recueil d'Ophtalmologie*, mai, 1911.

(4) **Nadel, Rafael.—Note on the pathogeny of congenital serous cysts of the iris. (Note sur la pathogénie des kystes séreux congénitaux de l'iris.)** *Archives d'Ophtalmologie*, juin, 1911.

(5) **Armaignac.—Congenital opacities of both corneæ in two children belonging to the same family.** *C.R. de Biologie*, T. LXIX, 1910, p. 396, and *Ann. de Méd. et Chir. Infantiles*, 15 novembre, 1911, p. 720.

(6) **Farnarier.—On certain folds in the developing retina. (Reply to M. Magitot.) [A propos de certaines plicatures de la rétine en voie du développement. (Réponse à M. Magitot).]** *Ann. d'Oculistique*, décembre, 1911.

(1) The case by **Tweedie**, of Baltimore, was that of a white man, aged 25 years, whose cornea showed somewhat spindle-shaped nebulous opacities, about 2½ mm. by 3 mm. in size, and made up principally of an accumulation of very small yellowish-brown dots of pigment. There was slight nystagmus, especially on looking to the left. R.V. 5/100; L.V. 5/5 with correction. The deposits appeared to be situated just beneath Bowman's membrane, and had apparently existed since birth. J. JAMESON EVANS.

(2) In the service of Terrien, **Hillion**, of Paris, records a case of deep physiological excavation of both papillæ, occupying nearly the whole surface of the discs. The patient was a man, aged 29 years. In the left eye the vessels appeared pressed over towards the nasal side, in the right they showed the usual arrangement. Both discs were greyish-white. There were no signs or symptoms of chronic glaucoma. BERNARD CRIDLAND.

(3) **Armaignac**, of Bordeaux, divides congenital opacities of the cornea into :

1. Primary non-inflammatory opacities: (*a*) Isolated opacities with or without malformation of the cornea or other parts of the eye. (*b*) Complete or incomplete opacities with buphthalmos, accompanied or not by hypertension. (*c*) Complete greyish or bluish opacities without malformation of the cornea or eye and having the appearance of ordinary parenchymatous keratitis.

2. Secondary inflammatory opacities: (*d*) White opaque leucomatous opacities following acute intra-uterine inflammation of the cornea. (*e*) Partial or total opacities with degeneration of the cornea.

Armaignac's patients, aged 3 months and 1½ months, showed almost complete opacity of both cornea without inflammatory symptoms in any part of the eyes. The opacities were noticed at birth, the corneæ were absolutely smooth and polished, but with the exception of about 2 mm. at the circumference, were of a uniform ashy-blue colour. The eyes were of normal size and form, and the lids and conjunctiva were normal. There was no bodily deformity and no history of syphilis or of hereditary transmission.

The author is convinced that the condition was not of inflammatory origin, and thinks that it was probably a case of arrested development of the cornea about the third month of fœtal life, when normally the hitherto opaque cornea becomes transparent. J. JAMESON EVANS.

(4) **Nadel**, of Paris, reports a case of a serous cyst of the iris, congenital in origin, in a boy of 11 years. The growth was observed by the mother at the age of 1½ years as a small spot in the infero-internal segment of the left iris. There was no history of trauma, but at the age of two, a small wound of the skin over the left frontal eminence was sustained as the result of a slight blow, the globe itself being untouched. A year later, an attack of acute inflammation occurred (? iritis or glaucoma), after which the cyst increased, growing towards the pupil.

Seen in June, 1910, at Landolt's clinic, the condition of the eye was as follows :—slight conjunctival hyperæmia, cornea clear ; in the infero-internal portion of the iris is a transparent cyst adherent at its periphery, smooth and regular in outline and giving the general appearance of a lens dislocated into the anterior chamber. A little flattened from before back, the cyst measured about 6 mm. transversely and 8 mm. vertically, filling nearly one-third of the anterior chamber. The cornea was in close contact with but quite free from its anterior surface. The base was thicker and broader than the rest, and the apex with thinned walls projected upwards and outwards like a tongue. The contents being perfectly clear, the black layer of the iris pigment could be seen through the cyst in its lower part, suggesting in appearance an eccentric pupil. A fine leash of vessels ran from below, losing itself in the middle on the anterior surface. The pupil was rendered horizontally oval in shape, measuring 6 mm. by 3 mm. vertically. R.V. = 1·25 ; L.V. = ·4. Tension normal. Fundus normal.

The cyst was removed ten days later, by means of an inferior iridectomy, and embedded in paraffin. The eye recovered uneventfully with V. = ·6.

Histological examination showed that the cyst originated from the anterior portion of the iris stroma, and that its epithelial lining had no connection with the retinal pigment layer of the iris.

Its free anterior wall was composed of two or three layers of polyhedral cells with an outer layer of fusiform cells, the posterior wall of iris stroma thickened here and there and lined by an epithelial layer of three, four, or even five layers of cubical cells with large nuclei, the most superficial of which were of pavement type in places.

The author regards the cyst as of purely congenital origin and due to the growth of lens-forming cells which had become included in that portion of the secondary optic vesicle, which afterwards becomes the iris.

BERNARD CRIDLAND.

(5) **Armaignac**, of Bordeaux, after having sketched the history of this affection, which although very rare, has been known and described for upwards of 150 years, reports a case which he saw a couple of months ago, and in which he believes he recognises an example of intra-uterine parenchymatous keratitis. The case was one of a female baby born with almost complete opacity of both corneæ, without any other obvious malformation of the eyes, and without evidences of constitutional syphilis. Four years previously another child had been born presenting absolutely the same aspect of the eyes. That baby died, when aged fourteen days, from cachexia. The hypothesis of an arrest of embryological development cannot be excluded in the absence of certain signs of the syphilitic diathesis.

SYDNEY STEPHENSON.

(6) **Farnarier**, of Marseilles, in reply to Magitot's criticism of his article on certain folds in the developing retina, states that the specimens on which it was based were fixed one in Bouin's and the other in Zenker's fluid. He contends that there was no evidence of any artificial disturbance in the eyes, and urges that the presence of thickening of the layer of ganglion cells in the angles between the plane of the fold and that of the rest of the retina, the erosion of the cells at the apex of the fold, and the fusion in the fold between the elsewhere distinct retinal layers are conclusive evidence against the theory that the folds were artefacts.

In reply to Magitot's claim that he has frequently seen similar appearances, the author states that he has examined the eyes of about 100 sheep's fœtuses at various stages of development and has only once seen the condition.

R. J. COULTER.

VII.—THE ACCESSORY SINUSES.

(1) Krauss, Frederick.—A report of a case of antral disease in a four months old child, with marked orbital symptoms. *Archives of Ophthalmology*, March, 1911.

(2) Wright, A. J. M.—Results of orbital cellulitis following ethmoidal operation. *Proceedings Royal Society of Medicine*, July, 1911.

(3) Wright, A. J. M.—Paralysis of right third nerve following ethmoidal operation. *Ibidem.*

(4) Wright, A. J. M.—Oedema of conjunctiva from acute frontal sinusitis. *Ibidem.*

(5) Thomson, StClair.—The relationship of diseases of the nose and accessory sinuses to affections of the eye and orbit. *Ibidem.*

(6) Martin, H. H.—Thrombosis of the cavernous sinus, with report of a case. *Ophthalmology*, January, 1912.

(7) Birkhäuser, R.—Keratitis dendritica after injury, in the presence of Empyema of the Antrum of Highmore. (Keratitis dendritica nach Trauma bei Kieferhöhlenempyem.) *Klin. Monatsbl. f. Augenheilkunde*, Januar, 1912.

(8) **Walters, James W.—Intra-orbital lesions secondary to disease of the accessory sinuses of the nose.** *Journal of Ophthalmology and Oto-Laryngology*, March, 1912.

(9) **Dufau, Fernand.—On the disorders of motility of the eye in sinusitis. (Des troubles de la motilité oculaire dans les sinusites.)** *La Clinique Ophtalmologique*, 10 juin, 10 juillet, et 10 août, 1912.

(10) **Friedenberg, Percy.—Visual symptoms of accessory sinus disease.** *Ophthalmology*, January, 1913.

(11) **Post, M. H.--Optic neuritis dependent upon inflammation in the ethmoid cells.** *American Journal of Ophthalmology*, June, 1913.

(12) **Fisher, J. Herbert. Case of arterio-venous communication in the cavernous sinus successfully treated by ligature of the common carotid.** *Proceedings of the Royal Society of Medicine*, June, 1913.

(13) **Takashima, S.—A case of bilateral orbital phlegmon following empyema of the frontal and ethmoid sinuses, with special reference to the pathological findings. (Ein Fall von doppelseitiger Orbitalphlegmone nach Empyem der Stirnhöhle und der Siebbeinzellen unter besonderer Berucksichtigung des pathologisch-anatomischen Befundes.)** *Klin. Monatsbl. f. Augenheilkunde*, Juli, 1913.

(14) **Paunz, Marc.—New contributions to optic nerve inflammations of nasal origin. (Neue Beitrage zur rhinogenen Sehnervenentzündung.)** *Archiv f. Augenheilkunde*, August, 1913, S. 76.

(1) The child, aged four months, had appeared to have a severe cold in its head a week before admission. On examination, it was found that the left side of the face was greatly swollen, with much œdema of the lids, while the eye was greatly proptosed, with movements markedly restricted. Pus exuded from a small opening in the alveolar process of the left superior maxilla, at about the site of the first bicuspid. On enlarging this opening, it was found that a probe could be passed into the outer part of the orbit, into the tumour which was causing the proptosis. A counter-opening was made into the nose and the cavity well drained. Recovery ensued. In curetting the sinus, two large well developed teeth were removed, each measuring about ¼ inch in length and quite hard. No incision was made into the orbit, except several weeks after the first operation, when a small sluggish abscess which had remained was opened. The case was one of antral disease with perforation into orbit and mouth. It has been thought that the antrum did not develop until later life, but Onodi has recently shown that it is present in fœtal life. In this case, there was no history of trauma. ROSA FORD.

(6) **Martin**, of Savannah, reports a case of septic thrombosis of the cavernous sinus which presents no atypical features. It lends support to the accepted belief that this affection is usually fatal. A. J. BALLANTYNE.

(7) A boy, sixteen years of age, had two attacks of dendritic keratitis within the space of a few weeks, following in each case an injury to the cornea by a chip of metal. In each attack the cornea was found to be insensitive. The boy suffered from chronic nasal catarrh, and it was found that there was an empyema of the maxillary antrum. **Birkhäuser,** of Basle, explains thus the connection between the various conditions.—The chronic empyema of the antrum led, probably through a toxic effect, to paresis of the first division of the fifth nerve, with consequent loss of sensibility of the cornea. The injuries occurred while the cornea was in this state, and dendritic keratitis resulted. A. J. BALLANTYNE.

(8) A reference is made to the anatomical investigations of W. H. Loeb, upon sections of wet decalcified heads in the anatomical department of the University of St. Louis.

Walters has had opportunity of studying these specimens with Loeb's assistance. The relations of the optic nerve and of the cranial nerves, in so far as they pertain to the subject in hand, are dealt with at length, and illustrative cases given.

A diagnosis is not always easy, even with the most careful intranasal examination. Transillumination and accurate skiagraphy are of great assistance to diagnosis and incalculable aids to the accuracy of operative procedures.

The symptoms upon which special stress is laid, are: firstly, a progressive pressure neuritis, a descending neuritis which is caused by pressure upon the optic nerve near the apex of the orbit, and which is followed by atrophy of the optic nerve varying with the extent and duration of the pressure. The causal factor here lies either in the sphenoidal sinus or the posterior ethmoidal cells, causing, through a thin internal wall of the orbit, an encroachment and pressure upon the optic nerve near the apex of the orbit. In these cases an early diagnosis is of extreme importance, as every day of delay means permanent loss or lowered vision. Secondly, orbital cellulitis, which, with the exception of those cases of metastatic or traumatic origin, is in almost every case due to accessory sinus disease, and the nature and the severity of the symptoms of which depend upon the primary infection in the nose.

HENRY L. G. LEASK.

(9) The long article by **Dufau,** of Dax, is a review (and a very good review) of this subject, which began to be interesting about twenty years ago. It is accompanied by a large bibliography which should prove of great service to anyone who happens to have such cases on hand, for the full title of each article is given. It would be impossible to make a useful abstract of Dufau's article.

ERNEST THOMSON.

(10) **Friedenberg,** of New York, gives in this paper a long and very complete account of the visual symptoms of accessory sinus disease. It does not lend itself to abstract.

A. J. BALLANTYNE.

(11) The case of optic neuritis in a boy of sixteen years, described by **Post,** of St. Louis, is particularly interesting from the point of view of the diagnosis. The neuritis was bilateral, the swelling of the discs being R. 4 D.; L. 6 D. Aching pains in the front part of the head and sensitiveness over the upper-inner angles of each orbit suggested an inflammation of the frontal, ethmoidal, and possibly sphenoidal cells. The patient was immediately sent to a competent rhinologist, who reported that the findings were negative. Cerebral tumour was then excluded by a neurologist. It was decided to have the nose and sinuses examined again. This was done by still another specialist, who found evidences of ethmoiditis and operated on the next day. As a result of this operation, the condition was cured. "An important lesson to be drawn from this experience," says Post, "is that the rhinologist must be allowed plenty of time to make a diagnosis in these cases. I presume the examination made by the first rhinologist, and the shrinking of the tissues following the use of cocain at the first examination, opened the passages between the ethmoidal and sphenoidal sinuses and the nose, allowing the pus contained in the sinuses to escape into the nose, showing the condition of the sinuses and clearing up the diagnosis. Probably, if the patient had returned to the physician who first examined him, as was requested, that physician would have found the same condition as was found by Dr. L.——"

ERNEST THOMSON.

(12) The title of this case by **Fisher**, of London, is perhaps a sufficient abstract.

In the discussion, **E. Brewerton**, of London, suggested that the internal carotid was the better artery to tie in these cases, because the blood pressure in the circle of Willis was better maintained thereby. He also suggested that the reason the common carotid is tied is that it is easier to tie than the internal. **Parsons**, of London, referring to the collected cases by de Schweinitz and Holloway, said that, if he remembered rightly, the cases were rather unsatisfactory, as in the course of time there was recurrence of pulsation, whatever had been done. ERNEST THOMSON.

(13) The case described by **Takashima**, of Saga, Japan, presented the following features: swelling of the left eyelids and conjunctiva, along with slight exophthalmos and outward deviation; limitation of outward movement of the eye; nasal discharge. No change in the exophthalmos and other eye symptoms after radical operation on the frontal sinus. Forty days later, increased exophthalmos, conjunctival hyperæmia, and relative failure of vision. No abnormality of the optic nerve visible. After twenty days, onset of exophthalmos and pain in right eye. Increase of these symptoms during following three weeks, with evidence of suppurative inflammation in right frontal and ethmoid cells. Operation on these followed by purulent meningitis and death.

The parts presented the picture of phlegmon of both orbits. The primary focus of infection is supposed to have been in the frontal and ethmoid cells of the left side. From these the cells on the right side would be directly infected, while the infection of the left orbit, and, later, of the right orbit, would take place through the agency of the communicating veins. The path of infection to the meninges was probably from the ethmoid to the sphenoid cells, and thence through veins to the meninges. Phlebitis and thrombo-phlebitis were found in the small communicating veins in question. A. J. BALLANTYNE.

(14) **Paunz**, of Budapest, reviews the literature, or rather some of the German literature, on this subject, and proceeds to give in detail the history of four cases. He summarises his paper as follows:

In all four cases the characteristic signs of optic neuritis of nasal origin were found. The sight diminished rapidly, and in the neighbouring sinuses the signs of acute or chronic inflammation were found. After the sinuses were drained, the sight improved quickly, the central scotoma for colours, which had been fairly regularly noted, disappeared, with diminution of the inflammation in the optic nerve.

As regards the therapy, operative interference is indicated in most of the cases. In only one of the four cases here reported, was there improvement without operation after spontaneous discharge of the secretion. Even if in the acute inflammations of the sinuses, there is a chance of spontaneous discharge, Paunz does not consider it right to wait long for a spontaneous healing. It is much better in these cases to open the sinuses as freely as possible, before any damage has been done to the optic nerve. Paunz holds that the exploratory opening of the posterior sinuses in doubtful cases is the proper procedure. HANFORD MCKEE.

VIII.—SPOROTRICHOSIS OF THE CONJUNCTIVA.

Wilder, William H.—Sporotrichosis of the conjunctiva. *Journal of Ophthal. and Oto-Laryngology*, February, 1914, p. 47.

Wilder, of Chicago, reported the following case of sporotrichosis of the conjunctiva to the Chicago Ophthalmological Society on October 20th, 1913.

A student, working with cultures of sporothrix, developed inflammation of both eyes, accompanied with slight soreness of the eyelids and tenderness of the neighbouring lymphatic glands. The palpebral conjunctiva was so swollen that the fornix rolled out in a mass when the lower lids were everted. Slightly raised greyish-yellow spots, 0.5 mm. to 2 mm. in diameter, were present on the palpebral conjunctiva and in the fornices. Some of these spots resembled small yellow ulcers, owing to the fact that the investing epithelium had been shed. Follicles numerous in other parts of the conjunctiva. General condition of patient good. Leucocyte count, 9,000. Smears made by scraping the elevations and conjunctiva, when stained with methylene blue, showed numerous pus cells but no organisms. Seven days after the inflammation began, the patient appeared to be ill, had a temperature of 100.5° F., and the preauricular, anterior cervical, submaxillary, and post-auricular glands were somewhat swollen and painful on pressure. On the eighth day, patient's general condition was worse: *malaise*, headache, temperature 101° F., and leucocyte count, 18,000. A growth of sporothrix was found in the culture tubes inoculated with scrapings from the shallow conjunctival ulcerations six days previously. On the ninth day of the inflammation, temperature was 102° F., and leucocyte count, 14,600. That night, pain suddenly set in, affecting the inner side of the upper end of one tibia, but it was speedily subdued by the application of an ice-bag. On the eleventh day, pain was experienced in the left elbow and wrist, as well as in the lower end of the right femur. On the following day (twelfth), conjunctiva much better, and ulcers healed; pains still present; afternoon temperature, 101° F. On the thirteenth day, severe pains in the right knee, around the head of the tibia, and also in the right ankle; temperature, 100.3° F.; leucocyte count, 11,200. On the next day (fourteenth of the disease) all pain had disappeared. Leucocyte count and temperature normal. Swelling of the glands had disappeared. Conjunctiva still red and the fornices considerably swollen.

From this date onwards, the follicles and the conjunctival swelling gradually disappeared, and in about two months, the lids presented a normal appearance.

Discussion.

C. P. McCullough described the bacteriological characteristics of the sporothrix.

Ludwig Hektoen commented upon the difficulty of demonstrating the spores of the disease in pus from human cases, of which in America the majority have occurred in the Missouri Valley. SYDNEY STEPHENSON.

IX.—OPERATIONS.

12.—Enucleation of the Eye, etc.

(1) **Weekers, L.—An operative method for cicatricial conjunctival bands which hinder the use of an artificial eye. (Procédé opératoire contre les brides cicatricielles conjonctivales empêchant la prothèse oculaire.)** *La Clinique Ophtalmologique*, 10 avril, 1912.

(2) **Jacqueau.—Super-acute meningitis following enucleation of an eye for post-traumatic panophthalmitis. (Méningite suraigue après énucléation de l'œil pour phlegmon post-traumatique.)** *Ann. d'Oculistique*, septembre, 1913.

(3) **Greenwood, Allen.—Enucleation with implantation of a hollow gold or glass sphere.** *Archives of Ophthalmology*, January, 1914.

(4) **Harman, N. Bishop.—An operation to improve the effect of an artificial eye.** *Lancet*, February 7th, 1914.

(1) The operation described by **Weekers**, of Liège, is as follows:—"Suppose we have to deal with multiple thick bands obliterating the lower cul-de-sac. These bands are first of all deeply incised with the bistoury, a conjunctival incision being made the whole width of the lid. This incision is parallel with the free border of the lid and distant from it about half a centimetre. In a similar way one makes in the skin of the lid an incision parallel with the border and at a distance from it the same as that of the conjunctival incision. Still by means of the bistoury, the tissues of the lid which lie between the two incisions are incised, and in this way one frees a muco-cutaneous bridge, half a centimetre broad, which unites the external angle of the palpebral fissure to the internal. Two or three sutures are then placed in the lower border of the flap, preferably by means of Reverdin's needle holder, as is indicated in Figure 2.* These sutures produce an intimate union between the conjunctival and cutaneous layers of the flap and greatly deepen the lower cul-de-sac. In order to avoid tearing or folding the tissues, I place an ordinary bead on the upper thread of each suture. The sutures are left in place three or four days. The skin wound is left to itself without sutures; its edges have no tendency to separate, and no faulty cicatrix results. After the sutures have been removed, the cul-de-sac formed by the operation, persists in the orbital cavity which can then take an artificial eye. In the case of a single cicatricial band, the muco-cutaneous incision does not require to be the length of the lid, but need only be placed at the part corresponding to the band. A single suture is sufficient."

The author says that a similar operation can be done on the upper lid, and also that in cases of simple obliteration of the lower cul-de-sac the same operative procedure has given good results. ERNEST THOMSON.

(2) **Jacqueau**, of Lyons, reports a case of death from meningitis following enucleation of an eyeball for panophthalmitis, caused by a penetrating injury with a piece of iron. Enucleation was advised and refused on the day after the accident, but no attempt appears to have been made to extract the foreign

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*As we do not reproduce the figure, it is necessary to explain that the needle is passed through the lower edge of the bridge or flap, from skin to conjunctiva, and is brought out free through the gap which has been made between the bridge and the rest of the lid.

body, which was found in the eyeball after its removal. The panophthalmitis set in on the evening of the sixth day after the accident; enucleation was performed on the following morning, and the symptoms of meningitis developed suddenly, twenty-four hours later. The patient died two days after the onset of the meningitis. The author considers that in his case the meningitis was so sudden and so acute, and followed the enucleation so rapidly, that it must be regarded as caused by it. He is of opinion that when panophthalmitis is definitely established, enucleation, which in the earlier stages is the operation of choice, should be replaced by de Lapersonne's *exenteration ignée.* R. J. COULTER.

(3) **Greenwood,** of Boston, implants a large-sized sphere (22 mm. in diam.) in Tenon's capsule after enucleation, and sutures the capsule over the sphere, so that it completely covers it; he then sutures the muscles together, and, finally, closes the conjunctival wound by interrupted suturing of the conjunctiva, placing these last stitches at right angles to the palpebral fissure.

The cosmetic results are excellent, the sinking in of the upper part of the upper lid being avoided. R. H. ELLIOT.

(4) The admirable ingenuity of **Bishop Harman**, of London, has devised what seems to be an excellent method of lessening the "obviousness" of the artificial eye in those patients who possess a wide palpebral fissure, a type of fissure which exposes the artificial eye so much more than does the narrow type.

Essentially the operation is tarsorrhaphy, but this is performed in a special manner. To obviate the well-known difficulty caused by the frenum at the outer canthus, the author has devised a special clamp, the blades of which are diamond-shaped and the under blade of which is notched, so as to accommodate the frenum. By means of this, when the extremity of it is 5 mm. beyond the canthus, as much as 12 mm. of each lid is framed by the clamp. It is then easy to incise the intermarginal space, with a bent Jaeger keratome for choice, and to separate the lids into the eyelash-bearing layer and the conjunctival layer. With a single double-needled thread, the two skin layers are united at two points, a length of drainage tubing being interposed on each lid in such a manner that the sutures are passed through, not merely over, the tubing. The clamp and the suture details are illustrated by figures. It is better to aim at doing too much rather than too little, since the former can be rectified in a day or two. The dressing and the ligature are removed on the fourth day, and the shell previously worn is slipped in. If too much has been done this can be remedied by dragging the lids apart a little. In judging the effect, allowance must be made for a slight apparent excess, caused by the swelling of the lids consequent on the operation and the four days' bandaging.

ERNEST THOMSON.

13.—Lacrymal Passages.

(1) **Barck, C.—A simplified method of extirpation of the lacrymal sac.** *Archives of Ophthalmology*, March, 1911.

(2) **West, J. H.—The treatment of dacryostenosis by opening the lacrymal sac from the nose. (Die Therapie der Dakryostenose durch Eröffnung des Tränensaches von der Nase aus.)** *Bericht der Ophthalmologischen Gesellschaft*, Heidelberg, 1913.

(1) The incision is made mesially to the insertion of the internal palpebral ligament, directly down to the bone. The lacrymal sac is detached from the

bone by curved elevators, and loosened all round by a curved hook. It is then severed at the entrance to the nasal duct. Then it is forcibly drawn down and out, and the excision completed. By this method the cupola is dissected easily, because it can be seen all the time, and also because the hæmorrhage is reduced to a minimum through the stretching, and because the cutting can be done close to the walls of the sac.

In thirty operations performed in this way, **Barck,** of St. Louis, Mo., has not been inconvenienced by hæmorrhage in one. Healing by first intention is the rule. ROSA FORD.

(2) **West,** working in Silex's *Klinik* at Berlin, has devised a new operation in which, in cases of stenosis of the lacrymal duct, he opens the sac from the nasal side and secures a permanent drainage into the middle meatus. He pointed out that all the present methods of treating lacrymal stenosis and the consequent dacryocystitis were very unsatisfactory, including even Toti's operation in the general condemnation. Caldwell, Killian, and Passow have made attempts to produce a permanent opening between the sac and the nose with little success. Even the ancients, including Galen and Alons, tried something of the sort, as did Percival Pott, although West does not mention him.

Under local anæsthesia, without touching the inferior turbinate, the mucous membrane covering the lacrymal eminence (*Tränenwulst*) is removed and a piece of the maxilla and the lacrymal bone is chiselled out, exposing the lacrymal sac. Then the nasal wall of the sac is taken away and the operation is complete.

The results have been excellent, and no trouble has been experienced from the patient blowing his nose, although in some cases air escapes from the puncta. West has succeeded in performing the operation even upon children.

Discussion.

Many of the surgeons who heard the paper joined in the discussion and most of them favoured the operation.

Hirschberg, of Berlin, said that he had seen some of West's cases and considered the results attained to be very promising. **Kuhnt**, of Bonn, insisted that the lacrymal disease depended upon caries of the ethmoid cells and sinus disease. The nose ought to be treated early in the disease. He did not think West's operation would be easy to perform, but he had not tried it. He thought Toti's operation was a good one, but it was necessary to acquire the requisite *technique*. **Vossius,** of Giessen, approved of von Eiken's operation, which sought to conduct the fluid from the sac into the antrum of Highmore. **Holt**, of Christiania, was not at all satisfied with the results following Toti's operation. **Guttmann**, of Berlin, had seen Dr. Halle, who had learned the method from West, perform the operation several times, and the results were good.

In reply, **West** said, that he did not believe that the sinuses were the chief source of lacrymal disease. In most cases the nose was found to be normal.

In this connection the reviewer can state that for some time past he has had most of his cases examined by a competent rhinologist and the usual verdict has been "nose normal." T. HARRISON BUTLER.

14.—The Cornea.

(1) **Löhlein, Walther.—A successful method of corneal transplantation.** *Archives of Ophthalmology*, May, 1912.

(2) **Jobson, G. B.—Keratotomy for the removal of corneal scars and opacities.** *Ophthalmic Record*, July, 1912.

(3) **Posey, Wm. Campbell.—Report of a case of conical cornea successfully treated by the actual cautery.** *Archives of Ophthalmology*, March, 1913.

(4) **Marbaix.—On two cases of corneal grafting. (A propos de deux cas de greffe cornéenne.)** *Ann. d'Oculistique*, juillet, 1913.

(5) **Mende, Roman von.—The employment of the mucous membrane of the lip in plastic operations on the cornea. (Ueber die Verwendbarkeit der Lippenschleimhaut zur tektonischen Keratoplastik.)** *Klin. Monatsbl. f. Augenheilkunde*, August, 1913.

(6) **Dimmer, F.—An operation for flattening partial corneal staphylomata. (Eine Operationsmethode zur Abflachung partieller Hornhaut-Staphylome.)** *Centralbl. f. prak. Augenheilkunde*, August and September, 1913.

(1) After practising his method on a number of guinea pigs with one perfectly successful result, the opportunity came to **Löhlein**, of Greifswald, to operate on a human subject.

There were numerous opacities in the eye of the man operated on, and vision was only 6/60 with correction. The fundus was normal. An iridectomy offered no prospect of better vision. The transplanted cornea was taken from an eye about to be removed on account of sarcoma of the choroid. The result of the operation was perfect adhesion of the transplanted flap and a clear cornea over the site of operation. Vision, five months after operation, 6/36 with correction. The flap remained somewhat less sensitive than the rest of the cornea. A year after operation, there were no further changes in the eye. At first there was some vascularisation of the flap, extending nearly to the middle, but the vessels cleared up later.

Löhlein's method is to use a rectangular flap extending from top to bottom of the cornea, and including at each end a small conjunctival flap with a rim of sclera attached. Only the sclero-conjunctival flaps are handled in removing the flap from the one eye to the other, so that the minimum amount of traumatism is done to the corneal substance. Two sutures are passed through each of the conjunctival flaps at the limbus. A flap of this shape and so fixed will not be displaced by the movements of the lids, and receives the maximum amount of nourishment possible in a normal manner. That the flap and the denuded area of cornea shall be of the same size is provided for by the use of a special instrument designed by the author, consisting of a two-pronged fork with a minute knife at the end of each prong. If healing were not to result, there is the fear of a staphyloma at the site of the thinned cornea, but Löhlein did not observe this in his guinea-pig cases. If the healing is smooth, it may counteract a commencing staphyloma. The author also suggests that the method may be used in cases of keratoconus. An examination was made of the cornea of the successful guinea-pig case, three months after the operation. A horizontal section of the cornea, together with the lens, shows a normal curvature with the surface smooth; the central portion is very little thicker than the peripheral portions. Under the microscope, with a low power, the cornea shows a stratified layer of epithelium of varying thickness, with irregularities on the surface and protrusions into the substance of the cornea; the most marked thickening of the epithelium is at the margins of transplanted flap which has evidently not shrunk. The flap is firmly united to the underlying tissue everywhere, from which it cannot be distinguished except that it contains more nuclei and takes up more eosin, although not more of other stains. With a high power, in the flap, the lamellæ are seen to be less regularly arranged, and at the layer of union the cross sections of very small blood-vessels are seen. Yet even with perfect healing, the author thinks, we can never expect to get perfect vision, because the irregularity of the epithelium and parenchyma, even without opacities, produces an effect like an irregular astigmatism. ROSA FORD.

(2) In cases of corneal opacities which seriously interfere with vision, **Jobson,** of Franklin, Pa., removes the abnormal corneal tissue in layers until clear and smooth cornea is encountered. For this purpose he has devised a small keratome set at an angle, so that it will cut in any direction. The cut corneal tissue is grasped by a special angled fixation forceps or held in a miniature tenaculum. He lays stress on the avoidance of infective inflammation and for this purpose carefully washes the operative area with normal salt, boric acid, or Seiler's solution, both before and after operation. "When the corneal tissue is removed carefully to a clear and healthy layer, then it seems as if repair of the denuded surface was effected by rapid proliferation of the epithelial cells and karyokinesis of polymorphonuclear leucocytes alone without help from the scar-forming corneal corpuscles." He records a case of opaque cornea rendered smooth and clear with vision of hand-movements improved to 20/70, and another of pseudo-pterygium where the cornea was made clear and a vision of 20/50 obtained in five weeks after operation. J. JAMESON EVANS.

(3) This patient of **Campbell,** of Philadelphia, was a woman of 25 years, whose vision had been apparently good in early childhood, but had steadily deteriorated since, until vision equalled in the R.E. with —1.25D. +6 D. cyl. ax. 160°, 5/12, and L.E. 3/100 not improved. The left eye was cauterised, a strabismus hook with point at red heat being employed. The area cauterised formed a triangle with the apex at the cone (which was just below and to the outer side of the centre of the cornea), and the base 2 mm. distant from the limbus on the temporal side of the cone. Seven months later, vision in this eye equalled without a glass, 5/22 and with —1D. +3.5 D. cyl. ax. 35°, 5/7½, whilst vision in the other eye had fallen to less than 5/100. Half the pupillary area was uninvolved by the scar, and as the edge of the scar was dense, there was no disturbance of vision by aberrant refraction. Later, the right eye was similarly treated with an equally good result.

Campbell believes that success from cauterisation lies in replacing the greater part of the cone by a mass of firm connective tissue, produced by the graduated application of the cautery, the apex being burned but very slightly.

ROSA FORD.

(4) **Marbaix,** of Tournai, encouraged by the results obtained by Magitot, has performed corneal transplantation successfully in two cases. The first patient, a mason, aged 70, had his left eye blind from total detachment of the retina caused by an injury during childhood, and the vision of the right eye so reduced from scars and a pseudo-pterygium following a lime burn that he was unable to go about alone. Ten months after the accident to the right eye, a disc 5 mm. in diameter was transplanted to it from the left cornea. Ten months later, the vision of the right eye at 1 metre was equal to 0.2 and the man was able to go about alone. The second patient, aged 53, had the vision of the left eye reduced to counting fingers at 1 metre, owing to detachment of the retina and a vascular leucoma of the whole cornea, dating from childhood, with convergent strabismus and a white anterior polar cataract in the right eye. A 5 mm. disc of clear cornea was removed from the left eye and transplanted to the external segment of the right cornea (*i.e.*, in the part of the cornea which was directed forwards). The vision of the eye before the operation is not given, but afterwards it counted fingers at 3 metres, and the patient stated that he saw as if through a sky-light

(*lucarne*), instead of through a slit, as before the operation, but he wished the opening was less to the side.

The author thinks that it is unnecessary to complicate the operation of corneal transplantation by uniting the graft with conjunctival pedicles or covering it with a conjunctival flap, and that the difficulty in obtaining a suitable graft can be overcome by taking it from the other eye, if the cornea is clear. He even suggests that a graft might be taken from the lateral parts of a sound eye, but it is difficult to conceive the circumstances under which this would be justifiable, as he admits that the operation is applicable only to very defective eyes, and up to the present the visual results are only such as are of benefit to patients dependent upon such eyes. He insists on the necessity for rigid asepsis. In his cases the surface from which the graft had been removed was covered with epithelium on the third day, and dark glasses were substituted for bandages on the sixth day in both eyes. R. J. COULTER.

(5) **Mende,** of Mitau, points out that in the treatment of the corneal ulcers of trachoma there are two classes of cases to be considered, which present somewhat different problems. In the first group the trachoma is inactive, or has caused very little shrinkage of the conjunctiva. Good results may be expected from the use of conjunctival flaps in these cases. In the second group there is advanced cicatricial contraction, and in these cases we have often to do with progressive marginal ulcers. Conjunctival flap operations are not so easy to perform under those circumstances, and the results are less satisfactory. The author has in several cases employed the mucous membrane of the lip, with satisfactory results. The conjunctiva bulbi is separated from the limbus at a point corresponding to the situation of the ulcer, and undermined for two or three millimetres. The base and edges of the ulcer are cleansed. A flap of mucous membrane, larger than the defect, is removed from the inside of the lip, and freed from fat and connective tissue. This flap is placed over the ulcer, so that its edge lies under the undermined conjunctiva, and is stitched in position. Both eyes are bandaged for five or six days, and the operated eye for a week more. In two months the transplanted flap is colourless and level with the corneal surface. A. J. BALLANTYNE.

(6) The method adopted by **Dimmer**, of Vienna, of dealing with these disfiguring affections is the following.—First, the epithelium is removed by means of a sharp spoon from that half of the staphyloma which lies nearest the limbus Then a small flap is made, by means of a Graefe knife, in the corneal scar. This flap is slightly curved, with its convexity towards the limbus. Then, with very small and very curved needles and the finest silk, one or two sutures, according to the size of the scar, are put in place, as shown by the accompanying diagram. Each suture has two needles. One needle is pushed through the peripheral edge of the wound from behind, forwards, and the second needle passed similarly, 2 mm. or 3 mm. distant from the first. Then both needles are pushed through the flap, also from behind, forwards. In the diagram the points of perforation of the needles are marked *a*, *b*, *c*, *d*. The threads lying on the surface are indicated by lines, and when they lie behind the scar by dotted lines. The portion of the corneal scar which has been freed from its epithelium is indicated by fine dots. As the sutures are tied, the central edge of the wound will glide over the peripheral edge, and in this region the scar will be doubled. The two surfaces will become adherent, and the uneveness will become gradually smooth. The sutures can be removed on the sixth or seventh day.

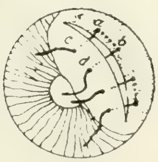

Fig. 1.

The cases most suitable for this operation are those with scars which are not too thick, but at the same thick enough to hold the sutures.

Any operative measure of this kind must be preceded by measures which will permanently relieve any increase of intraocular tension, and for this purpose a combination of an iridectomy, immediately after a cyclodialysis, is recommended. A. LEVY.

15.—Miscellanea.

(1) **Boer, W.**—On the formation of cysts in the conjunctiva after operation for staphyloma. (Ueber Cystenartige nach Staphylomabtragung entstandene Gebilde der Conjunctiva.) von Graefe's *Archiv f. Ophthalmologie*, Bd. LXXXI, i Heft, 13 Februar, 1912.

(2) **Komoto.**—An operation for the relief of argyrosis of the scleral conjunctiva. (Ein operatives Verfahren gegen die Argyrosis der Skleralbindehaut.) *Centralbl. f. prak. Augenheilkunde*, Mai, 1913.

(3) **Ollendorff, A.**—Upon the value of Kuhnt's conjunctival covering of perforating wounds. (Die Kuhnt'sche Bindehautverwertung bei perforierenden Verletzungen.) *Zeitschrift für Augenheilkunde*, Juni, 1913.

(4) **Cruise, R. R.**—A subconjunctival drain after trephining. *Proceedings of the Royal Society of Medicine*, June, 1913.

(5) **Schloffer, H.**—The operative treatment of the visual disturbances associated with tower skull. (Zur operativen Behandlung der Sehstörungen beim Turmschädel.) *Klin. Monatsbl. f. Augenheilkunde*, Juli, 1913.

(6) **MacNab, Angus.**—An operation for the excision of the conjunctival sac and lid margins. *Trans. Oph. Society U.K.*, Vol. XXXIII, 1913, p. 50.

(1) **Boer**, of Halle, a. S., reports on a case of a large cyst which appeared two years after Critchett's operation for staphyloma. The cyst consisted of two concentric fibrous layers with an internal and external epithelial lining. Boer discusses the origin of these cases, two of which have been reported, and while denying their connection with accidental implantion of epithelium during the operation (Uhthoff), considers that they are due to a conjunctival fold which becomes drawn in between the points of the suture, sealed up, and gradually distended. Thus both the internal and external epithelial layer is analogous to conjunctival epithelium. R. GRUBER.

(2) Argyrosis sufficiently severe to require interference is very rare in Europe, but should cases be met with, and the chemical treatment with sodium hyposulphite, or with the mixture of ammonium chloride and tartaric acid, be unsuccessful, the method devised by **Komoto**, of Tokio, seems very reasonable. He removes that portion of the affected scleral conjunctiva which is ordinarily visible, and replaces it by conjunctiva obtained from an enucleation or exenteration. The case which he reports seems to have been very successful. A. LEVY.

(3) **Ollendorff,** of Darmstadt, speaks very favourably of Kuhnt's method

of covering a perforating wound with a flap of conjunctiva, a procedure which is, he says, too much neglected by ophthalmic surgeons. It is not even mentioned in Fuchs' text-book. In twenty cases, he saved the eye in eighteen and the vision in sixteen. It is best to use the double pedunculated flap, and in some cases to cut it from the side opposite to the wound. The author recommends that the flap be cut and the sutures passed ready to be tied before the wound is trimmed and any prolapse excised. By this means loss of vitreous may often be avoided or reduced in amount. The base area from which the flap is taken need not be treated; it rapidly becomes covered with new conjunctiva. Later on, the non-adherent part of the flap can be cut away. Vertical flaps are always best, horizontal ones generally get rolled up and displaced. The flap must always be cut larger than appears necessary.

T. HARRISON BUTLER.

(4) By means of a No. 2 silk suture permanently buried in the episcleral tissue, **Cruise**, of London, has succeeded in making the area of aqueous filtration after trephining more diffuse than is apt to be the case. The suture, after the trephining has been done, is made to enter the subconjunctival space and the episcleral tissue 5 or 6 mm. from the margin of the flap (made for the trephining) on one side, crosses the area of the flap, and again is passed subconjunctivally and in the episcleral tissue for 5 or 6 mm. on the other side. It is cut off at each end and buried. The reflected flap is then sutured in position. This modification has been carried out in six cases, and the results have all been most favourable. ERNEST THOMSON.

(5) It is pointed out by **Schloffer**, of Prague, that so far the results of decompressive operations performed for the visual disturbances of oxycephaly have not compared favourably with those obtained in other conditions known to be associated with elevated intracranial pressure. This fact is an argument against the view that the defects of vision in this disease are the result of increased intracranial pressure.

Recently Behr, of Kiel, has found in tower skull a peculiarity of structure to which he attributes the visual disturbance. Owing to the deformity of the base of the skull, there is a shortening of the lower wall of the bony optic canal, so that the posterior end of the lower wall at this point is formed by the carotid artery, and the optic nerve comes to be pressed between the artery and the bony roof of the canal.

With this suggestion in view, Schloffer has examined a number of tower skulls and also a number of normal examples, and finds that in the former, the condition mentioned is often so well marked that it might well allow of pressure on the nerve in the manner suggested, while in the normal skull the peculiarity is never present to any marked degree.

If Behr's theory is correct, treatment ought to aim at the removal of the bony roof of the optic canal at its posterior end, and the author found that it was possible to do this on the dead subject. Moreover, he has now done it twice on the living. The operation was performed in two stages: first, the elevation of a large osteo-cutaneous flap in the frontal region; and, secondly, the elevation of the brain from the orbital plate of the frontal bone, and the removal of the whole roof of the bony optic canal. Details are given of the two cases referred to. In both, the optic nerve was atrophic before operation. There was perhaps slight improvement in vision, but the author does not lay any stress on this, claiming only that the operation can be performed without any injury to the optic nerve. The question as to the curative effect of the procedure must be decided by operations performed in earlier stages of the visual defect. A. J. BALLANTYNE.

(6) **MacNab**, of London, finds it useful in certain cases where an artificial

eye cannot be worn for this or that reason to remove the conjunctiva, the margins of the eyelids, and the tarsal plates, and, finally, to suture the skin of the eyelids over the empty socket. He has elaborated a *technique* for this purpose. SYDNEY STEPHENSON.

X.—PARALYTIC SQUINT IN CHILDREN.

(1) **Kaz, Raphael.—A case of the Stephenson type of oculo-motor polioencephalitis.** *Ophth. Rev.*, June, 1912.

(2) **Lundsgaard, K.—Some cases of acquired paralysis of ocular muscles in children. (Einige Fälle von erworbener Augenmuskellähmung bei Kindern.)** *Klin. Monatsbl. f. Augenheilkunde*, Dezember, 1912.

(1) **Kaz,** of St. Petersburg, reports a case of a boy of seven years suffering from spastic paresis of the left extremities, following an indefinite febrile attack. There was also double optic neuritis, without visual disturbance, which cleared up in two months. This patient's cousin, aged five years, two years later was seen with paralysis of the left external rectus; there was a history of febrile attacks. Partial improvement took place.

A. H. PAYAN DAWNAY.

(2) **Lundsgaard,** of Copenhagen, in the year 1911, in the course of two months, had the unusual experience of meeting with no fewer than five cases of ocular paralysis in children. In four of them the affected muscle was the right external rectus, and there was no recovery of function. The fifth child had a double partial ptosis and limitation of ocular movements, especially upwards. Recovery occurred in this case. The children all presented general symptoms, which, in view of the fact that there was an epidemic of acute anterior poliomyelitis in Denmark at that time, made it practically certain that they were all cases of that affection. Medin was the first to point out that acute anterior poliomyelitis is not infrequently accompanied by paralysis of cranial nerves. The eye muscles may be affected singly or in combination, the external rectus being the most frequently involved. Isolated ptosis, nystagmus, and disease of the optic nerve have also been reported. The symptoms, when they occur, are usually unilateral. A. J. BALLANTYNE.

XI.—AFFECTIONS OF THE SCLERA.

(1) **Snell, Albert C.—Episcleritis periodica fugax.** *Trans. Amer. Ophth. Society*, Vol. XII, Part iii, 1911, p. 736.

(2) **Vogt, A.—Metastatic scleral abscess. (Metastatischer Skleral-Abscess.)** *Centralbl. f. prak. Augenheilkunde*, Mai, 1911.

(3) **Cecchetto, Ezio.—On the variations of the ocular tension in sclero-choroiditis posterior. (Delle variazioni della tensione oculare nella sclerocoroidite posteriore.)** *La Clinica Oculistica*, Ottobre, 1911.

(4) Murakami, S.—A case of necrotic-hæmorrhagic ulcer with circular extension from the sclera to the cornea. (Ueber einen Fall von nekrotisch-hämorrhagischem Geschwür mit zirkulärer Ausbreitung von der Sklera auf die Hornhaut.) *Klin. Monatsbl. f. Augenheilkunde*, Februar, 1912.

(5) Schleisinger.—Diffuse rheumatic scleritis. (Escleritis reumatica difusa.) *Arch. de Oftal. Hispano-Amer.*, Febréro, 1912.

(6) Parsons, J. Herbert.—" Mooren's " ulcer associated with ulceration of the sclerotic. *Proceedings of the Royal Society of Medicine*, December, 1912.

(7) Dunn, Percy.—A case of metastatic abscess of the sclera followed by perforation and prolapse of the iris. *Lancet*, December 14th, 1912.

(8) Kalaschnikow, W. P.—Scleritis and gout. (Skleritis und Podagra.) *Centralbl. f. prak. Augenheilkunde*, Juli, 1913.

(9) Peters, A.—Congenital changes of the sclera. (Zur Kenntniss der angeborenen Veränderungen der Sklera.) *Centralbl. f. prak. Augenheilkunde*, August-September, 1913.

(10) de Lapersonne, F. — Cysts of the sclerotic caused by traumatic inclusion of epithelium. (Kystes de la sclérotique par inclusion epithéliale traumatique.) *Centralbl. f. prak. Augenheilkunde*, August-September 1913.

(11) Stephenson, Sydney.—A case of brawny scleritis. *Proceedings of the Royal Society of Medicine*, December, 1913.

(12) MacNab, Angus.—Case of infiltration in and around the capsule of Tenon. *Proceedings of the Royal Society of Medicine*, January, 1914.

(13) Gilbert, W.—Upon the ætiology and pathological anatomy of brawny scleritis. (Zur Ætiology und pathologischen Anatomie der sulzigen Skleritis.) *Archiv f. Augenheilkunde*, Januar, 1914.

(14) Lawford, J. B.—Case of chronic brawny scleritis. *Proceedings of the Royal Society of Medicine*, Section of Ophthalmology, March, 1914.

(1) **Snell**, of Rochester, U.S.A., gives a detailed account of two cases of episcleritis periodica fugax, one of which was watched for a considerable time. In the first patient there appeared to be a close connection between the ocular attacks and the menstrual epochs, since no bouts occurred at any other time. The best explanation that Snell can offer of this peculiar form of episcleritis is "that the local vaso-motor disturbance is caused by some irritation which has resulted from a general metabolic disturbance to which a neurotic disposition or a disturbed nervous system is contributory."

SYDNEY STEPHENSON.

(2) In December, 1910, Velhagen reported a case of metastatic abscess of the corneal limbus (THE OPHTHALMOSCOPE, March, 1911, p. 198) and **Vogt**, of Aarau, now brings forward a similar case:

The patient suffered from carbuncles of the arms and back, when suddenly the left eye became inflamed. There was great ciliary injection, especially downwards, and about 2 mm. below the cornea there was a small red prominence, covered by inflamed conjunctiva and very tender. Cornea below cloudy; some iritis. In the course of a week, a deep crater-like ulcer formed at the site of the prominence, with clean-cut edges and sloughy base. As this did not seem to get any better, the slough at the bottom of the ulcer was excised and then gradually the condition got better, and a dense violet-coloured scar formed at the site of the ulcer. A few posterior synechiæ were left, and on directing the patient to look down as far as possible, a small white mass of choroiditis could be seen opposite the site of the ulcer. A. LEVY.

(3) Gallenga suggested to **Cecchetto** that he should make a study, with the aid of the tonometer of Schiötz, of the tension in certain ocular diseases, and especially in myopic sclerochoroiditis. In Gallenga's clinic paracentesis of the anterior chamber is frequently employed to stop the development of myopia.

Cecchetto finds that in myopic choroiditis, especially when the myopia is high, the tension is always less than normal, with an average of 13·3 mm., the normal averaging from 15 mm. to 18 mm. Hg. He notes further that after repeated puncture of the anterior chamber, the tension rises and remains for some time at the higher level; there is no corresponding elevation of the blood-pressure. HAROLD GRIMSDALE.

(4) **Murakami,** of Tokio, describes the case of a young woman who, after extraction of teeth, developed gingivitis, nasal obstruction, and epistaxis. Then severe swelling of the submaxillary, parotid, and other glands occurred, followed by perforating ulceration of the hard and soft palates. At this stage parturition occurred without complication. Her general condition became worse, suppuration occurred in the parotid, which was incised, the wound became gangrenous, and the patient died about nine months from the onset of her illness. About two months after the beginning of her illness, scleritis developed in the left eye, but this made a spontaneous recovery. Later, when swelling of the left side of the face appeared, there was some protrusion of the left eye, due to orbital inflammation. To this was added a circular septic ulcer of the conjunctiva and sclera, which extended over the anterior part of the sclera and invaded the cornea. Streptococci were found in the contents of the parotid gland, and the author looks upon the whole condition as a streptococcal infection originating in the mouth, the eye affection starting from a metastatic deposit of the organism in the episcleral tissue.

A coloured illustration shows the appearance of the affected eye. The pathology of the condition is also described and figured.

A. J. BALLANTYNE.

(5) The patient was a medical man, who had been attending a patient with diphtheria, and had received a splash of saliva in the eye. The condition arose a short time after, and was soon followed by chemosis. There were no signs of general diphtheria, and, on the other hand, there shortly became visible rheumatic complications, arthritis of the hand and thigh, showing to the patient that he was in for an attack of rheumatism, to which he was not unaccustomed. HAROLD GRIMSDALE.

(6) **Parsons,** of London, reports the case of a woman, aged about fifty years, who for eighteen years had suffered from corneal ulceration of recurrent type. Seven years ago she had attended Moorfields Hospital, and had been treated for what was evidently the opacity due to Mooren's ulcer, associated with breaking-down scleral nodules in the left eye. The scleral ulcers were very resistant to treatment, but eventually healed. Four years later she saw Parsons, on account of an affection of the right eye similar to that of the left, four years previously. The appearance was somewhat that of a localized episcleritis close to the limbus on the outer side. The left eye remained quiet. The "episcleritic" patch broke down, and the neighbouring cornea became involved in the ulceration. Just as these ulcers were showing signs

of healing, a second large nodule appeared in the sclera, surrounded by an area of intense vascularization. No light was thrown on the case by a general examination, except that on admission she had pyorrhœa alveolaris. Wassermann negative. Tuberculin reactions not tried. For the scleral ulcer the galvano-cautery did more good than the many other forms of local treatment. Parsons had been unable to find any record of cases of Mooren's ulcer associated with ulceration of the sclera. ERNEST THOMSON.

(7) The very interesting and rare case, reported by **Dunn**, of London, is as follows.—A man, aged 40 years, was admitted to the surgical wards of the West London Hospital with symptoms of strangulated inguinal hernia. After the hernia had been operated upon, there was a hæmatoma of the scrotum, which eventually suppurated. Twenty-eight days after admission, and eighteen days after the hæmatoma had been incised on account of threatened suppuration, Dunn was called in. The left eye had suddenly become painful, with general ciliary and conjunctival injection. In the limbus, in the upper vertical meridian, was a round, yellowish-white swelling resembling an ordinary phlyctenule, only much larger. The cornea was clear, the iris movements were natural, and the tension was normal. It was inferred, in view of the patient's septic condition, that the swelling was probably embolic in origin. The swelling increased in size, and fourteen days later was found to have disappeared and to have given place to a large prolapse of iris. Two days later the prolapse was excised. More than three months later, the eye was found to be quiet, and to have V.A. of 6/9.

ERNEST THOMSON.

(8) **Kalaschnikow** supports the view of Panas, namely, that most cases of ordinary scleritis and episcleritis are of the same nature as the chronic gouty affections of joints (*arthritis urica*). From this point of view, the eyeball and its socket can be considered as an enarthrodial joint with tissues similar to those entering into the formation of such a joint, *e.g.*, fibrous tissue and synovial membrane. The treatment of these sclerites must therefore be on the same lines. In acute cases moist heat and immobilisation; later, massage and more or less stimulating ointments. To promote lymph circulation, eserin or pilocarpin should be given (atropine is to be avoided). Most important of all is the treatment of the causal condition. A. LEVY.

(9) **Peters**, of Rostock, reports upon the histological examination of an eye which was congenitally malformed. He gives no details of the case in which it occurred, and, as he states that the globe had lain in alcohol for thirty years, these may have been lost. The type of malformation found is a rare one, and consists in the presence of a pseudo-cornea, an area in which the sclera is thinned, the lamellæ more regularly arranged, and numerous nuclei present, the whole being more or less transparent. The true cornea is thickened, opaque, staphylomatous, and resembles sclera more than cornea.

A. LEVY.

(10) The case recorded by **de Lapersonne**, of Paris, is that of a woman, aged 19, who at three years of age suffered a perforating wound of the right eye. The wound healed very slowly, and several years after a white swelling was seen beneath and in the cornea. The eye was quite blind, had attacks of pain, and was therefore removed. The swelling occupied the lower-inner quadrant of the globe, only slightly involving the cornea, but extending over the sclerotic. It was white and covered with very thin conjunctiva, and quite firm. The pathological examination showed the cornea to be normal over its greatest extent. The membrane of Descemet seemed to have disappeared, and the iris was adherent to the cornea over its whole extent. The ciliary body on one side was quite normal. On the other side there was a

cystic cavity measuring 5 mm. by 9 mm. This cyst was covered by conjunctiva and its wall consisted of scleral tissue. The interior of the cyst was lined by epithelium which resembled conjunctival epithelium. The cavity contained a certain amount of blood and desquamated epithelium. Besides the above there was a very marked glaucomatous excavation of the disc, and many old hæmorrhagic foci in the choroid and vitreous.

The explanation is probably that the original injury caused an invagination of the conjunctiva. This proliferated in the anterior chamber and into the ciliary region. Later, it distended the scleral scar, never very strong on account of the inclusion of uvea or conjunctiva, and became covered with sclerotic. It is possible that the increased intra-ocular pressure commenced soon after the injury and forced the cyst to grow out through the weak scleral scar instead of in the globe, and the development of the cyst may have prevented the occurrence of a buphthalmos. A. LEVY.

(11) This case, by **Stephenson**, of London, is reported (with additions) on p. 273 of the present issue of THE OPHTHALMOSCOPE.

The fact may be mentioned that one or two speakers dissented from Stephenson's diagnosis of brawny scleritis. For example, **E. T. Collins**, of London, thought it might be an instance of Tenonitis. **Holmes Spicer**, of London, suggested "solid œdema of the conjunctiva" as the diagnosis, and **Leighton Davies**, of Cardiff, sarcoma of the choroid, which had perforated the sclera.

(12) **MacNab**, of London, exhibited a mild and early example of a condition that resembled that shown by Stephenson at an earlier meeting (see No. 11 above).

(13) **Gilbert**, of Munich, observes that although eight cases of brawny scleritis have so far been examined pathologically, we have not yet succeeded in getting any closer to the ætiology of the disease.

His own case was as follows.—A woman, aged 76 years, who had tophi upon nearly all her finger-joints, as well as upon the metatarsus, developed a violent inflammation of the left eye at the beginning of May, 1911. There was slight exophthalmos and limitation of movement inwards. The ocular conjunctiva was raised over the edge of the cornea as a brawny tumour, and down and in there was a humped prominence of the sclera. The cornea was covered with a dense vascular opacity. The condition (accompanied by violent pain) got rapidly worse, and the eye became blind. Under the supposition that it might contain a tumour, it was enucleated upon June 6th, 1911. The specimen was placed in Birch-Hirschfeld's solution.

The pathological findings may be briefly described as under.—The conjunctiva and episclera rose as a sort of wall around the edge of the cornea. They contained many vessels and plasma cells; the latter spread along the ciliary vessels as far as the outer layers of the ciliary muscle. The anterior parts of the sclera were markedly thickened. The scleral lamellæ, especially over the flat part of the ciliary body, were pressed apart by cells, which were mainly degenerate polymorphonuclear leucocytes. Bands of scleral lamellæ were found to be in a condition of necrosis. The choroid behind the ora serrata was swollen to three or four times its usual size by an infiltration of round cells.

Gilbert assigns his case to gout, and endeavours to bring its pathological appearances into line with those that characterise that affection.

SYDNEY STEPHENSON.

(14) A man of 70 years consulted **Lawford**, of London, on account of one of his eyes that had been inflamed for some three months, but without failure of sight. No material history. The case was a pretty typical instance of

so-called "Brawny Scleritis." Wassermann test negative. A differential blood count proved to be normal. During the three months the man remained under observation, the condition slowly became worse and slight iritis developed. Treatment by large doses of potassium iodide apparently did no good. Microscopic examination of a portion of the swollen tissues (by R. A. Greeves) showed merely the changes of an inflammatory process of a subacute type. There were many thin-walled blood-vessels, but no thickened vessels could be seen. The inflammatory cells were not arranged in follicles or nodules. SYDNEY STEPHENSON.

XII.—REMEDIES.

(Fifth Notice.)

(1) Green John, Jr.—Keratitis Disciformis: prompt recovery following subconjunctival saline injections. *American Journal of Ophthalmology*, October, 1913.

(2) Goldschmidt, M.—The specific therapy of pneumococcus infections of the human eye, especially that of ulcus corneæ serpens by ethylhydrocuprein. (Zur spezifischen Therapie der Pneumokokkeninfektion des menschlichen Auges, besonders des Ulcus corneæ serpens durch Aethylhydrokuprein.) *Klin. Monatsbl. f. Augenheilkunde*, Oktober-November, 1913.

(3) Schur, Max.—Clinical observations on the action of ethylhydrocuprein on ulcus corneæ serpens (pneumococcal). [Klinische Beobachtungen ueber die Wirkung des Aethylhydrokuprein gegen Ulcus corneæ serpens (Pneumokokken).] *Klin. Monatsbl. f. Augenheilkunde*, Oktober-November, 1913.

(4) Jones, E. L.—The usefulness of dionin in early senile cataract. *Annals of Ophthalmology*, October, 1913.

(5) Dutoit, A.—Report about the subconjunctival and intrabulbar use of Syrgol. (Beobachtungen ueber subkonjunctivale und intrabulbare Anwendung des Syrgols.) *Archiv f. Augenheilkunde*, November, 1913.

(6) Davis, A. Edward.—The diagnostic and therapeutic uses of tuberculin in ocular diseases. *Annals of Ophthalmology*, January, 1914.

(7) Fradkine, S.—Neo-salvarsan in ocular therapeutics. (Le Néo-salvarsan en thérapeutique oculaire.) *La Clinique Ophtalmologique*, 10 janvier et 10 février, 1914.

(8) van Lint.—The collateral reaction to medicaments. (La réaction collaterale aux medicaments.) *La Clinique Ophtalmologique*, 10 janvier et 10 février, 1914.

(9) Offret, A.—Thirty-two cases of gonococcal ophthalmia treated with Nicolle and Blaizot's vaccine. (Trente-deux cas d'ophtalmies gonococciques traitées par le vaccin de Nicolle et Blaizot.) *Ann. d'Oculistique*, février, 1914.

(10) **Hird, R. Beatson.—The value of cycloplegics in estimating the refraction of the eye.** *Midland Ophthalmological Society,* February 3rd, 1914.

(1) **Green**, of St. Louis, considers that in his case of keratitis disciformis, a case which conformed accurately to the description of the disease given by Fuchs, repeated subconjunctival injections of 2 per cent. saline brought about the cure of the condition. Treatment of the concurrent conjunctivitis had had no effect, but the first subconjunctival injection brought about an improvement which continued under further injections until V.A. was 5/8. Keratitis disciformis, says the writer, has generally been regarded as a self-limited disease uninfluenced by any form of treatment. ERNEST THOMSON.

(2) Ethylhydrocuprein hydrochloride, also known as optochinum hydrochloricum (Zimmer), is a substitution product of quinine. It is a white salt easily soluble in water, which, both *in vitro* and *in vivo*, has a powerful bactericidal action on the pneumococcus.

Goldschmidt, of Leipzig, gives his experiences in the use of the drug, chiefly in cases of pneumococcal corneal ulcer. He finds that a 1 per cent. solution is most useful. Stronger solutions cause too much irritation, or even destruction of the conjunctiva, while weaker solutions are not sufficiently active. The solution is dropped into the eye hourly, keeping it in contact with the cornea for about half a minute. This treatment is continued until the ulcer is clean, and healing has begun. He then substitutes noviform ointment. The only other treatment employed is atropine. He says that the first application is painful, but that anæsthesia comes on, and lasts for some time, so that subsequent applications are free from pain.

The cases discussed in this paper include corneal ulcer with hypopyon, ulcers with dacryocystitis, ulcers with lagophthalmos, commencing pneumococcus ulcers, and "pneumococcus carriers." In the last class, instillations of the 1 per cent solution rendered the conjunctival sac sterile in from twelve hours to two days. In the ulcer cases the results were good. The progress of the ulcer was at once affected, and arrested, on the average, in three days. There was no extension of the deep infiltration, and no occurrence of smaller superficial infiltrations, after commencement of the treatment.

The author concludes that this drug has a far-reaching curative action on pneumococcus infections in the human eye. Its action is specific, *i.e.*, it does not affect the staphylococcus, diplobacillus, etc. He suggests that it might be used as a prophylactic in cases of corneal injury, and as a preliminary to intraocular operations in cases where the presence of the pneumococcus is known or suspected. He does not refer to the method of direct application of the drug by swab to the ulcer.* A. J. BALLANTYNE.

(3) **Schur,** of Tübingen, has obtained astonishingly good results in eight unselected cases of pneumococcal ulcer of the cornea from the use of ethylhydrocuprein hydrochloride (optochin hydrochloride—Zimmer). At first he employed hourly instillations of a one per cent. solution, as well as direct application of the solution to the ulcer, but later he omitted the drops, and confined himself to applying to the ulcer a cotton wool probe saturated with one or two per cent. solution. He applies the probe with a little pressure, and keeps up the application until the corneal tissue in the immediate neighbourhood of the ulcer shows slight opacity. This requires from one to four minutes. Cocaine is first instilled to lessen the burning sensation caused by the drug. The stronger solutions (two per cent., etc.)

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*Compare paper by Schur in same number of *Klin. Monatsbl. f. Augenheilkunde* (see below).

have a caustic action on the conjunctiva, as is shown by erosion of corneal epithelium, chemosis, and the formation of a conjunctival membrane like that produced by silver nitrate. The solutions can be sterilised without alteration of their activity, and should be made up in small amounts, as they act best when fresh. A. J. BALLANTYNE.

(4) **Jones**, of Cumberland, Md., gives details of fifteen cases of incipient cataract with a view to showing that, used early enough, dionin has the power of bringing the condition to a standstill. The remedy is not even worth trying in advanced cases. The formula usually employed is a 4 per cent. solution of dionin in mercury cyanid, 1/1,000 Three drops in each eye daily. SYDNEY STEPHENSON.

(5) The silver preparation called "Syrgol" (prepared by Siegfried Chemical Factory, of Zofingen, Switzerland) was used by **Dutoit**, of Montreux, in a 1 per cent. solution. For injections the solution was always warmed. The injection of 1 c.cm. to 2 c.cm. under the conjunctiva causes but little pain. The same holds good for the intrabulbar injection after puncture of the anterior chamber. The injections were repeated every second day, if necessary. The irritation stage, which comes on twenty-four hours after, seemed to Dutoit remarkably less than after an injection of 2 per cent. saline solution.

The results are summarised as follows :—

(A) *Four cases of ulcus serpens, one complicated with dacryo-blennorrhœa.*—

These were treated with Syrgol injections One case received five, two cases four, and one case three subconjunctival injections. The ulcerative processes were healed on the twenty-second to the thirty-second day of treatment. The examination of the material in two cases gave pneumococci and staphylococci, once pneumococci, once staphylococci. Perforation of the cornea did not occur in any of the cases.

(B) *Three cases of traumatic perforation of the globe.*—

Two cases received one intrabulbar Syrgol injection, and the other case received two. These cases all ran normal courses, and were discharged on the twentieth, twenty-fifth, and twenty-eighth day respectively.

(C) *Two cases of panophthalmitis.*—

One received three intrabulbar injections, the other, two intrabulbar and three subconjunctival. Healing occurred in the first case after one month, and in the second after two months.

(D) *A case of flap infection after cataract extraction.*—

This needed three subconjunctival injections, and cleared up on the sixth day of treatment and the tenth after operation. HANFORD MCKEE.

(6) The conclusions of **Davis,** of New York, are: (1) that the tuberculin reaction tests play as important a part in tuberculous disease as the Wassermann reaction does in syphilis ; and (2) that tuberculin, correctly used, is the most valuable remedy we possess in the treatment of ocular tuberculosis. Stress is laid on the need for care in dealing with so powerful and toxic a therapeutic agent. R. H. ELLIOT.

(7) The interesting article by **Fradkine**, of Paris, is partly concerned with his own work and conclusions and partly with the work of others. Regarded as a review of the subject, it seems unfortunate that he has not given a detailed bibliography.

The action of salvarsan and neosalvarsan is identical, only the doses and method of preparation are different. Neosalvarsan is one-third feebler than salvarsan. Solutions of neosalvarsan should be made with small quantities of water, namely 10 cc. for 0 grm. 45 and 0 grm. 60 ; 15 cc. for 0 grm. 75 and 0 grm. 90 of neosalvarsan. Only intravenous injection should be employed. Immediate sterilization by a single dose has never been proved. Progressive sterilization is to be aimed at, six or seven days being allowed between the doses. The author commences with 0 grm. 30 and, if there are no complications, continues with doses of 0 grm. 45, 0 grm. 60, 0 grm. 60, 0 grm. 60, *i.e.*, five doses. After a month's interval, whether Wassermann is negative or positive, if the disease does not seem to have been cut short, another series of injections is given.

On the subject of interstitial keratitis the author has some interesting remarks. Everyone knows how capricious and indifferent have been the results of '606' in this disease. How is this to be explained? Walther has shown that the elimination of arsenic from the anterior chamber and cornea takes place within twenty-four hours, whereas the blood contains it for a longer time. If then we can keep the cornea constantly bathed in the drug, perhaps we shall get better results. Fradkine is at present experimenting with a method of giving small doses each forty-eight hours. Again, speaking of his actual results in this disease, he has had fourteen cures, one improvement and two failures, out of twenty-two observations. Even where the curative action is absent, blepharospasm, photophobia, and too intense vascularization are suppressed more quickly than by any other drug. Treutel and Ehrlich have drawn attention to the fact that the cornea being an avascular structure, penetration of the drug takes place imperfectly. Fradkine says that where the cornea is vascular, salvarsan (or neosalvarsan it is to be understood) does good rapidly, but where it is avascular, in what may be called the grey form of the disease, it is of no use.

With regard to other diseases.—In acute iritis, irido-cyclitis, choroiditis, and choroido-retinitis, cure is rapid and complete. In chronic or congenital cases the drug has no action.

In secondary or tertiary optic neuritis success is almost certain and rapid. In parasyphilitic atrophy one can only hope to arrest further change.

In glaucoma secondary to a syphilitic lesion, and even in sympathetic ophthalmia, arsenobenzol should be tried.

In a general way, then, Fradkine says that acute, recent, and active ocular affections are very "happily" influenced by this drug. It is superior to mercury and iodide. Nevertheless, in certain cases a judicious combination of all three may be of service. ERNEST THOMSON.

(8) The article by **van Lint**, of Brussels, although appearing in an ophthalmological journal, is mainly general rather than ophthalmological. In any case it is hardly suitable for abstract, and should be read in the original. S. E.

(9) **Offret**, of Paris, has treated thirty-two cases of gonococcal ophthalmia with injections of the vaccine prepared by Nicolle and Blaizot.* This consists of 1 part of gonococci grown on glucose-gelose (rabbit's serum), emulsified and well washed in a 7 per 1,000 solution of fluoride of sodium, and 9 parts of syncoccus similarly treated. The syncoccus is a coccus which is usually associated with the gonococcus in urethral gonorrhœa, but grows on media without serum, with an orange colour, and is Gram-positive. When inoculated in human beings, it provokes no reaction, and has the same curative action as gonococcic vaccines. The fluoride of sodium is used because it does not coagulate albumin, causes only slight alterations in the microbes, and prevents autolysis. One cubic centimetre of the serum contains 500 million microbes. The injections were given intramuscularly in children and intravenously in adults. As a rule, they were repeated every second day, the first consisting

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*For references to this vaccine see THE OPHTHALMOSCOPE, January, 1914, p. 57, February, 1914, p 116 and p. 117. – EDITOR.

of 1/2 c.cm., and the subsequent ones of 1 c.cm. To avoid the caustic action of the fluoride, the serum was diluted with from 1·5 to 2 c.cm. of physiological serum.

The intravenous injections never caused any local reaction, but the intramuscular ones were sometimes followed by redness, and exceptionally gave rise to slight induration. In adults a slight general reaction, consisting of a rigor, with elevation of temperature to from 38° C. to 39° C., and occasional nausea, was the rule on the evening following the injection, but these symptoms always passed off before the following morning.

Irrigations were always given in addition to the vaccines, and the great majority of the cases were also treated with silver nitrate and argyrol.

The cases treated were classified as follows.—i. Ophthalmia neonatorum, fifteen cases, nine without and six with corneal ulceration. ii. Conjunctivitis in children and adults, thirteen cases, seven without and six with corneal ulceration. iii. Metastatic conjunctivitis, three cases. iv. Iritis, one case. In two of the cases of ophthalmia neonatorum, corneal ulcers developed while the patients were under treatment with the vaccine, in spite of diminution of the discharge and the swelling of the eyelids. In one of these no silver preparation was used.

The conclusions drawn from the investigation are that the vaccine of Nicolle and Blaizot almost always diminishes the inflammatory symptoms in ophthalmic gonococcal inflammation, and frequently reduces the secretion, rendering it clear and mucous in place of thick and purulent. As a rule, however, the secretion does not disappear as quickly as the inflammatory symptoms, and a slight amount containing gonococci may persist for a long time after all visible lesions of the lids and conjunctiva have disappeared. These quiescent forms of conjunctivitis retain their serious nature, as they can cause relapses with corneal complications, and the treatment of gonorrhœal ophthalmia should therefore aim at getting rid of every trace of secretion. The vaccine appears to give particularly good results in metastatic conjunctivitis, but has no favourable action on corneal ulcers complicating conjunctivitis.

Practically, the vaccine is a valuable therapeutic agent, but for the present should be used in conjunction with the classical treatment by irrigation and preparations of silver. R. J. COULTER.

(10) **Hird**, of Birmingham, believes that in homatropine we possess a perfect cycloplegic, provided a trustworthy sample of the drug be applied in the following way: a 2 per cent. solution of homatropine and cocaine should be dropped into the eye every ten minutes for four or five applications, and the error of refraction should be estimated one hour after the first instillation. The outstanding disadvantage of homatropine is its cost. Hird employs a cycloplegic in every case of asthenopia and headache.

SYDNEY STEPHENSON.

CORRESPONDENCE.

[While THE OPHTHALMOSCOPE will at all times welcome correspondence from its readers, the Editor does not hold himself responsible for any views expressed in this column.]

THE OPERATIVE TREATMENT OF CONICAL CORNEA.

To the Editor of THE OPHTHALMOSCOPE.

Dear Sir,

I was much interested in the article of P. H. Adams, M.A., D.O., on "The Operative Treatment of Conical Cornea," with the report of eight cases in which the Elliot trephining operation had been performed. I also had conceived the idea that the Elliot operation would be beneficial in cases of conical cornea, and wish to add the brief report of another case operated upon after this method :

F. H., aged twenty, factory girl, in poor physical condition. Old trachoma each eye, and in the left eye a marked cone with diffuse opacity at, and just below, the tip of the cone. Vision reduced to counting fingers at two feet. Constant pain in the eye. Ophthalmometer showed radius of curve of less than five millimetres in length, with marked irregular astigmatism.

Elliot operation under general anæsthesia. The conjunctiva was thin and friable from scar tissue as the result of the old trachoma. A small buttonhole was made in the conjunctival flap near the temporal border of the cornea. However, as the trephine was made directly above, it had no effect on the result, as the anterior chamber re-formed on the second day. A small peripheral iridectomy was performed, and a single suture applied to hold the conjunctiva in position. Eye pad and bandage applied. Anterior chamber was established on second day. Atropine was instilled daily, and the bandage kept on for two weeks.

Ophthalmometer showed radius of curvature 7·8 m. or normal ; tension by tonometer, 5 mm. Hg. Five weeks after operation, same condition of tension, and cornea remains normal, but vision remains poor, 10/200. With the peripheral iridectomy extended to the pupil margin (to be done later) the vision should be greatly improved. All pain has gone from the eye. Sub-normal tension is a marked feature, and although it is rather early to speak of the ultimate result, as regards the cone returning, the prospects seem good for a permanent flattening with continued subnormal tension.

Yours truly,
A. E. DAVIS.

50, WEST 37TH STREET,
NEW YORK.
March 20th, 1914.

BOOK NOTICES.

Ophthalmoscopic Diagnosis based on Typical Pictures of the Fundus of the Eye, with special reference to the needs of general practitioners and students. By Dr. C. ADAM, of Berlin. Translated by Matthias Lanckton Foster. With 86 coloured pictures on 48 plates, and 18 illustrations in the text. London : William Heinemann (Rebman, Ltd.), 21, Bedford Street, W.C. 1913. Price 25s. net.

Dr. Adam's *Ophthalmoskopische Diagnostik* was noticed very favourably in THE OPHTHALMOSCOPE of October, 1912, soon after its appearance.

We now extend a cordial welcome to the English translation by Dr. Matthias Lanckton Foster, of New Rochelle, New York. The translation is ably done, the plates have lost little in reproduction, and the book is likely to prove of great use to those for whom it is primarily intended, namely, general practitioners and students. There are few ophthalmic surgeons who could not gather something from its well arranged text and beautiful plates. Adam's treatise may be said, indeed, to occupy a niche of its own, in that it is a systematic guide to ophthalmoscopic diagnosis, accompanied by coloured illustrations intended simply to further that end. The word "Atlas" has been avoided of set purpose. The ophthalmoscopic appearance—for example, a black spot in the fundus oculi—has been used as a means of classification and diagnosis. In order to facilitate ready reference, the book is provided with no fewer than four indices. SYDNEY STEPHENSON.

The American Encyclopedia and Dictionary of Ophthalmology. Edited by CASEY A. WOOD, assisted by a large staff of Collaborators. Volume II, B to Cataract, Incipient. Chicago: Cleveland Press. 1913. Price (paper covers) $5.00; cloth, $6.00; half morocco, $7.50.

The second volume of the *American Encyclopedia and Dictionary of Ophthalmology* fully bears out the promise of the first. It is slightly larger, containing 776 pages as compared with 729. Of these pages, 122 are occupied with the headings Bacilli, Bacteria, and Bacteriology of the eye; 71 with Blepharoplasty; 102 with Blindness; 18 with Brain; and 63 with part of the article on Cataract. Other important articles are those on Bright's disease and on the Eyes of Birds. Several biographies are included, among which may be mentioned those on Becker, Bartisch, Boerhaave, Böhn, Bowman, and Burnett. One notes with pleasure that the late George Carpenter, of London, is not omitted.

The article on Bacteriology of the eye is at once the longest and most important in the volume. It (along with other articles coming under letter B, such as Bacilli, Bacteria, etc.) forms the greater part of a text-book. We find articles or paragraphs, as the case may be, on Bacterial therapy; the *technique* of smears, cultures, and so on; the Bacteriology of conjunctivitis, dacryocystitis, wound infections, panophthalmitis, corneal ulcerations; and on Immunity. No doubt, the subject will receive further elaboration under iritis, cyclitis, and uveitis. There are some excellent coloured plates and a number of micro-photographic reproductions.

The article Blepharoplasty is also excellent. It contains some sixty figures in the text, illustrating details of operations on the eyelids.

The words Blind and Blindness cover a wide range of subjects: the causes of and prevention of blindness (the latter a long article) preparation for oncoming blindness, simulated blindness, the blind in fiction, and others. Colour blindness, education of the blind, mind blindness, and a number of other kindred subjects do not come into this volume. This kind of separation is a weak point of all encyclopædic works, and presumably cannot be avoided.

We have been impressed with the promise of completeness in so much of the subject of Cataract as appears in this volume. There are literally hundreds of names of cataracts, from Cataracta Accreta to Cataracta Viridis. Not content with Latin, the compilers have put these names of cataracts in French as well; doubtless, they will appear in other languages in other volumes, for example under the letter K.

We confess to some slight disappointment with a few of the illustrations, notably with the photographic reproductions of dead and gone ophthalmologists.

Some of these are far from what they might be from an artistic standpoint, although the intention to perpetuate the memory of the great in this manner is a laudable one. The coloured plate of trachoma bodies is spoiled (in the copy which we have) by the showing through of letterpress from the back, a position which letterpress ought not to occupy. But these, after all, are quite minor criticisms.

Lastly, we note with much pleasure the full measure of recognition which is given to European work and workers. Indeed, the scholarly style of the articles, a style which is vastly different from that sometimes associated with the literary output of the Continent of America, is worthy of all praise.

ERNEST THOMSON.

Notes on Ophthalmology. By J. JAMESON EVANS, surgeon to the Birmingham and Midland Eye Hospital, and lecturer on ophthalmology, University of Birmingham. Birmingham: Cornish Brothers, Publishers to the University, 39, New Street. 1913. Price 2s. 6d.

This modest little book will doubtless prove very useful to those for whom it is written, namely, students attending the course of lectures on ophthalmology given by Mr. J. Jameson Evans in the University of Birmingham. Indeed, it deserves a wider circulation than the author seems to anticipate for it, since it is a carefully and clearly drawn synopsis of the leading facts of modern ophthalmology. By the discriminating employment of various kinds of type, the different sections are set forth in such a way as to strike the eye readily. The book is interleaved with blank sheets for the students' notes.

With one or two statements made by Mr. Evans some surgeons might be inclined to join issue For example, that salvarsan is no use in interstitial keratitis (p. 16), and that the gonococcus is not found in the discharge from cases of metastatic gonorrhœal conjunctivitis (p. 11).

The index, like the book itself, is unpretentious, but adequate.

SYDNEY STEPHENSON.

THE OPHTHALMOSCOPE DIARY.

1914.

French Ophthalmological Society	May 4th	Paris.
Section of Ophthalmology: Royal Society of Medicine.	May 6th	London.
American Ophthalmological Society.	May 12th	Hot Springs, Va.
Scottish Ophthalmological Club	May 23rd	Glasgow.
Section of Ophthalmology: Royal Society of Medicine.	June 10th	London.
American Medical Association: Section of Ophthalmology.	June 22nd to 26th	Atlantic City
Oxford Ophthalmological Congress	July 8th to July 10th	Oxford.
British Medical Association: Section of Ophthalmology.	July 29th to July 31st	Aberdeen.
International Congress of Ophthalmology.	August 10th to August 15th	St. Petersburg.
American Academy of Ophthalmology and Oto-Laryngology	October 19th to October 21st	Boston, Mass.

THE

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A MONTHLY REVIEW OF CURRENT OPHTHALMOLOGY.

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ORIGINAL COMMUNICATIONS.

ALTERNATING HYPHÆMA: AN UNUSUAL RESULT OF CONCUSSION OF THE EYEBALL.

BY

ARTHUR J. BALLANTYNE, M.D.,

SURGEON TO THE EYE INFIRMARY, GLASGOW.

THE phenomenon observed in the case here recorded, namely, the disappearance of a hyphæma on fixation of a near object and its reappearance on relaxing the accommodation, is, so far as the writer is aware, unique. It is at least sufficiently novel to justify one in putting it on record.

Case.

The patient, a man, 48 years of age, was struck on the right eye by a stone on 24th of February last. When he appeared at the Eye Infirmary on the 28th, there was a small cutaneous ecchymosis over the right cheek bone, a rupture of the conjunctiva bulbi about 12 millimetres long, parallel with and about 4 mm. from the lower inner-margin of the cornea, and a deposit of blood in the lower angle of the anterior chamber reaching to a little above the lower margin of the pupil, the diameter of which was three millimetres. The blood was fluid, and occupied the most dependent part of the anterior chamber at whatever angle the head was held.

The pupil of the injured eye was slightly wider than that of the other and less active, but all its reactions could be elicited. Vision in the right was 4/36, and in the left 4/12. With his reading glasses (+2.5 D.sph.) he read Jaeger 14 with the right eye and Jaeger 2 with the left, the near point being nine inches in each case.

The feature of the case which at once arrested attention was that when he directed his gaze to a finger held six or seven inches from his face there was at once a considerable fall in the level of the hyphæma, and then a more gradual fall until, in the course of about five to ten seconds of maintained fixation, all trace of blood had gone from the anterior chamber, leaving merely a little greenish staining of the lower part of the iris. When he was instructed to look again into the distance, the blood rapidly re-appeared, apparently from the lower angle, and after one or two repetitions of the experiment was actually greater in amount than at the first examination. The phenomenon occurred even with the fixation object directly in front of the affected eye, so that accommodation was not accompanied by any lateral movement of the eye. Digital pressure on the globe, either on the cornea or on the sclera, produced no change in the amount of the hyphæma. The disappearance and re-appearance of the blood with near and far fixation was demonstrated many times in the course of this first examination, and there could be no doubt that the phenomenon depended on the contraction and relaxation of the ciliary muscle.

The patient was admitted for indoor treatment and observation. On admission, a drop of atropine was instilled into the injured eye, and during the following two days, while the eye remained under the influence of the drug, the to and fro movement of the blood could not be demonstrated. By the next day, however, the pupil had returned to a diameter of about 5.5 mm. and reacted slightly both to light and in near vision, and the disappearance and re-appearance of the blood could be elicited as before. The last day on which blood was seen in the anterior chamber was the 8th of March, the twelfth day after the accident, and it was still possible to bring about diminution of the hyphæma by fixation of a near object, although the disappearance was neither so rapid nor so complete as at first.

Over and above this alternation of the hyphæma which one could produce at will so long as there was blood in the anterior chamber, the size of the hyphæma varied much from day to day, on account of the fact that after more or less complete absorption fresh extravasation of blood occurred. Thus, the day after admission the blood occupied two-thirds of the anterior chamber. Next morning there was only a small trace at the inferior angle, but the slight exertion of getting out of bed and putting on a few clothes produced a large hyphæma. Two days later, the blood had been again almost entirely absorbed, but a recurrence was observed after he had been stooping slightly to look in his locker for his spectacles. The same thing occurred again the following day.

The other features of the case were as follows.—When the anterior chamber had cleared sufficiently to allow a complete view of the iris, it was found that the pupil was vertically oval, but there was no evident injury to the iris. Eleven days after the injury, one or two minute irregularities, possibly ruptures, of the pupillary margin were discovered, and also a posterior synechia at the inner side. The first view of the fundus, obtained four days after admission, was hazy, and no fundus lesion was detected; a few days later, however, a small patch of choroidal atrophy was found, two or three disc-diameters from the disc downwards and inwards, and there was a flocculent opacity in the vitreous, which was otherwise clear. The other fundus was normal. The tension of the injured eye was sub-normal. It was taken with the Schiötz tonometer on one occasion only, eleven days after admission, and registered 14 mm. of mercury, as against 18 mm of mercury for the other eye. From about the tenth day after injury, the anterior chamber of the right eye was found to be shallower than that of the left. Perhaps it was a little deeper in its lower part than elsewhere, but it was imposssible to be sure of any difference, and there was certainly no definite retraction of the iris at any point. The pupil continued to be oval in form and slightly larger than the other, but contracted to light directly and consensually and in near vision. The slight greenish tint persisted in the lower part of the iris for two or three weeks. Even after disappearance of the hyphæma, vision remained defective, being 4/36 Snellen and No. 6 Jaeger.

Remarks.

The points of interest in the case are the nature of the lesion and the mechanism by which the disappearance and re-appearance of the blood was brought about.

We may dismiss as of no consequence the minute irregularities or ruptures of the margin of the iris. It is doubtful if they could have been the source even of the original hæmorrhage, and in any case they would not account for the recurrences or for the peculiar movements of the blood to which our attention has been directed. Since one did not see the occurrence either of the original hæmorrhage or of the subsequent extravasations, the source of the blood is uncertain, but there can be no doubt that when the blood was made to disappear by accommodation it passed away through the angle of the anterior chamber. Not only so, but by placing the patient first on his right side and then on his left the blood could be made to occupy the temporal or nasal angle of the anterior chamber, and on repeating the experiment, it was seen that the blood always drifted towards the inferior angle when accommodation took place. This put it beyond all doubt that the blood left and returned to the anterior chamber through an opening of limited extent at the lower angle. This being so, what caused the blood to disappear and whither did it go? The intimate association of its disappearance with the act of accommodation, the suspension of the phenomenon while accommodation was suspended by the action of atropine, and its independence of external pressure exerted by the finger or by the extra-ocular muscles, are sufficient proof that contraction of the ciliary muscle was the actual cause of the disappearance of the blood. In the first instance, before the existence of a localised lesion had been proved, it seemed possible that the advance of the anterior surface of the lens in accommodation drove the blood, along with aqueous, out of the anterior chamber by the normal filtration channels, that, in fact, we were dealing with a physiological displacement of aqueous rendered visible by the presence of fluid blood. Further observation, however, rendered this view extremely unlikely. It would be difficult on this hypothesis to understand how the same phenomenon could have escaped observation in many other examples of hyphæma. Moreover the fact that the blood did not escape through the nearest part of the filtration angle, but invariably passed towards the inferior angle of the anterior chamber, proves conclusively that the blood did not come and go through the physiological filtration channels, but through an opening of an abnormal kind. This still leaves the possibility that the advance of the surface of the lens in accommodation caused the displacement of the hyphæma; but it is very doubtful whether the small displacement of aqueous caused by an advance of the anterior surface of the lens through a distance of 0.5 mm. would suffice to account for the disappearance of a quantity of fluid equal to almost half the contents of the anterior chamber. If the blood was not driven out of the chamber by the act of accommodation, the only other possible mechanism is one which would cause it to be *drawn* out. We thus arrive at the conclusion that with each act of accommodation part of the aqueous was drawn away through a channel which was in communication with the inferior angle of the anterior chamber, and that it was driven back into the anterior chamber on relaxation of the accommodation, that this channel was a pathological one produced by concussion of the eye, and that it was the seat of the original and also of the subsequent hæmorrhages.

Taking into consideration the anatomy of the ciliary angle, what is the probable nature of the lesion? The lesions in this position which have been found to result from blows on the eye are: rupture of vessels of the iris, iridodialysis, dehiscence of the iris, rupture of the sclera (complete or incomplete), rupture of the inner wall of Schlemm's canal, detachment of the ciliary body, and splitting of the ciliary body. Iridodialysis in its typical form was certainly absent in this case, and even the minor form was excluded by the shape of the pupil. Nor was there any evidence of dehiscence of the iris. Rupture of iris vessels might have been the source of the original hæmorrhage, but neither this nor either of the other two conditions mentioned could explain where the blood was accommodated when it disappeared during near fixation. The same statement applies to incomplete rupture of the sclera and rupture of the canal of Schlemm. It is difficult to understand what could have happened to the blood during accommodation if either of these were the sole lesion present.

The matter seems to narrow itself down to a choice between the two remaining lesions, namely, detachment and splitting of the ciliary body. Both of these have been observed anatomically, and they were described by E. Treacher Collins in "Researches into the Anatomy and Pathology of the Eye." In the former, tearing of the fibres forming the outer wall of the sinus of the anterior chamber detaches the anterior part of the ciliary body from the sclera just behind the canal of Schlemm, while in the second form of injury the rupture occurs a little further back and extends into the ciliary body between the radial and circular fibres of the ciliary muscle. Either form of injury would fulfil the requirements of our case to this extent, that both would involve the effusion of blood, and that in both cases the contraction of the circular fibres of the ciliary muscle in accommodation would produce a recess, in the one case between ciliary body and sclera, and in the other case within the ciliary body itself, into which aqueous could flow, and out of which it would be forced when the relaxation of the ciliary muscle allowed the parts to return to their original relations.

Were the ciliary body detached from the sclera, one would expect contraction of the radial fibres of the ciliary muscle to cause the ciliary body to slip back along the sclera, and this in turn would cause more or less narrowing of the visible iris at that part. As a matter of fact, in the case described by Collins, the clinical appearances included disappearance of the iris at the seat of the injury; but this need not necessarily be the case if the detachment is of only moderate extent. In the detachment of the ciliary body and anterior part of the choroid which follows in some cases the extraction of cataract or the performance of iridectomy, and which has been found microscopically to be accompanied by rupture of the fibres of the pectinate ligament setting up communication between the anterior chamber and the suprachoroidal space, no deformity of the pupil is described. In the case under discussion the pupil was slightly oval, with its long axis pointing towards the seat of injury, and this may have been due to a slight backward displacement of the ciliary body and root of the iris from such a detachment. The shallowness of the anterior chamber and the hypotony present in this case suggested that we might find evidence of detachment of the choroid, for these are two common features of the reported cases of post-operative detachment of the choroid. A careful examination with the dilated pupil was made, but with negative result. It is to be noted, however, that this point was not specially looked into until the patient had been about a week under observation, that is, about ten days after the accident.

Splitting of the ciliary body might be expected to give rise to very similar signs, with less tendency for the parts to undergo displacement. It seems impossible to determine on clinical grounds alone whether detachment or splitting of the ciliary body was the lesion in this case. But the former injury seems to have been much more frequently observed than the latter, and moreover, a mere splitting of the ciliary body between the circular and longitudinal muscle fibres would produce a gap of very limited capacity. The manner in which the bloodstained aqueous disappeared, even when it was in sufficient quantity to occupy nearly one-half of the anterior chamber, and the apparent localisation of the exit near the centre of the lower angle, suggested the presence of a recess of limited circumferential extent, but capable of accommodating a fair quantity of fluid.

One feels justified therefore in expressing the opinion that we were dealing in this case with a separation of the ciliary body from its scleral attachment at the inferior angle of the anterior chamber, allowing a free communication between the chamber and the suprachoroidal space; that the blood in the anterior chamber originated in the rupture of vessels of the suprachoroidal space; and that during contraction of the ciliary muscle in accommodation the ciliary body, and perhaps the anterior part of the choroid, was drawn away from the sclera, chiefly by the contraction of the circular fibres of the ciliary muscle, the neighbouring aqueous flowing into the space so formed and flowing out again into the anterior chamber on relaxation of the ciliary muscle.

It is probable that the choroidal lesion seen ophthalmoscopically had no connection with the accident. It was an atrophic patch of apparently older date. It is difficult to relate the rupture of the nasal aspect of the bulbar conjunctiva to the ecchymosis over the malar eminence. One must suppose that the blow of the stone was a glancing one. The absence of ecchymosis or bruising at the inner end of the lids suggests that the conjunctival wound was the result of direct injury, and not of bruising through the lid.

TENO-PLICATION:

A Method of Advancement without Resection of Tendon for Convergent Squint.

BY

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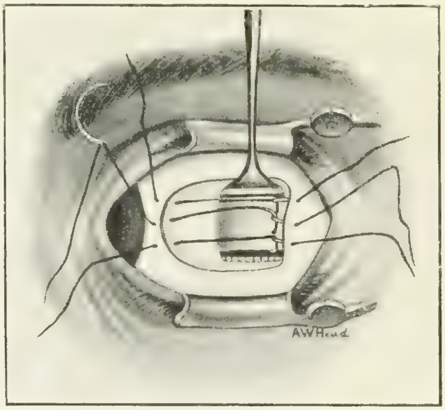
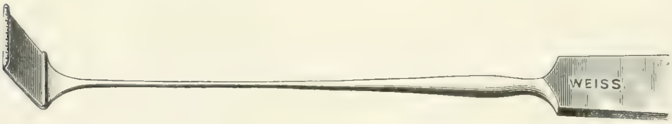
THE method described below may be used in place of the usual advancement operation combined with tenotomy of the internal rectus, but is of special advantage in cases where it is desired to do an advancement without simultaneous tenotomy of the opponent muscle—a line of operative treatment which is finding increased favour with ophthalmic surgeons of the present day. As no originality is claimed for the idea itself, an apology is doubtless expected from anyone having the temerity to add another to the already long list of modifications of the classical advancement operation, but the simplicity and good results obtained from this particular method in a number of cases have encouraged the writer to publish his *technique* in the hope that others may give it a trial.





The operation is an "open" one and, briefly, consists of a simple carrying over of the external rectus tendon together with the conjunctiva and capsular tissue and re-attachment further forward without tenotomy or resection of the tendon.

The advantage of leaving intact the original insertion of the muscle is specially evident in simple advancement, since in the event of any slipping, or cutting through of the sutures, usually the result of faulty insertion, the muscle cannot fully retract as is so likely to happen in the usual method of advancement without tenotomy of the internal rectus owing to the constant traction of the latter muscle.

Provided, however, that the sutures are given a deep hold on the sclera at the new anterior attachment, there is little likelihood of their slipping or cutting through here, and owing to the transverse direction in which the sutures are passed through the whole width of the tendon behind, it is practically impossible for them to cut through in this situation. Definite over-correction of the deviation to the extent of about 4°-5° should be aimed at as the immediate result of operation in those cases where no simultaneous tenotomy of the internal rectus is done, so as to allow for slight stretching of the new attachment of the muscle.

No over-correction, be it noted, is required when tenotomy of the internal rectus is simultaneously performed on the same eye.

Taking the average length of the external rectus tendon to be about 7 mm., and its scleral attachment about the same distance from the corneal margin, we get a possible shortening of 14 mm. In actual practice the writer has obtained a shortening of 12 mm. From actual measurements of the angle of deviation before and after operation, the writer finds himself in agreement with certain other observers that only 2·5° of correction are to be obtained from each millimetre of shortening, and he now takes the fact as a basis for calculation as to the actual amount of shortening required in a given case.

In the case above alluded to where 12 mm. of shortening were obtained the squint angle was 25° before operation and of alternating type. No internal tenotomy was done and at the end of the operation divergence was present of about 5° which disappeared in a few days, the final result being orthophoria and excellent binocular vision.

The effect of the operation is to bury the tendon which becomes adherent to the underlying sclerotic, thus offering a broad area of resistance to the traction of an untenotomised internal muscle.

The thin membraneous tendon of the external rectus lends itself admirably to this procedure, and the slight hump produced at the site of folding quickly becomes smaller and disappears at the end of a few weeks.

The angle of deviation should be carefully estimated before operation on the tangent scale and the functional condition of the external rectus ascertained. It is obviously unfair to expect a good result from simple advancement in the case of a weak stretched muscle of impaired abduction power.

The best results by this method are to be obtained from squints of the alternating variety with good vision in each eye and normal muscle movements. The only special instrument required is a flat tendon guide with angled handle on which the tendon lies, and which is made in two sizes, 8 mm. and 10 mm. respectively. It can be used for either eye with equal facility. The larger size is usually employed for adults, the smaller for younger patients, or where there is less room than usual on account of deeply set eyes or other cause. The outer edge is notched in millimetres, and the guide is flanged so that the tendon lies snugly on it, so that it is practically self-retaining during the operation.

The field of operation is constantly under observation—the guide, when in position, preventing any disarrangement of the parts from any unexpected movement of the patient's head or eyes.

Technique.—The patient having been prepared in the usual way, the conjunctival sac is washed out with warm boric lotion, a few drops of a 5 per cent. solution of cocaine with 1-1000 adrenalin are instilled, and the speculum is inserted.

The operator stands on the right side of the patient's head for the left external rectus muscle, and on the left side of the head in the case of the right external rectus. The conjunctiva is picked up with forceps about 4 mm. from the corneal limbus and reflected precisely as in the usual advancement operation.

The parallel fibres of the external tendon are then defined, and with a snip of the scissors a buttonhole is made through the loose subconjunctival tissue and capsule just above, and then below the margin of the tendon close to its insertion. A tenotomy hook is then passed underneath the tendon and held in the left hand of the operator who then frees, by blunt dissection with the closed scissors, the tendon as far back as necessary to permit of the introduction of the tendon guide. Directly the guide is passed beneath the tendon, the tenotomy hook is withdrawn. An assistant then takes charge of the guide, holding the handle from below in the case of the right muscle, and from above in the case of the left external rectus. This is done to facilitate the passing of the sutures. Three curved needles carrying double threaded No. 1 silk are in readiness, and taking one in a needle holder, the operator picks up the middle of the cut reflected conjunctiva with forceps, and passes the suture through it and then transversely through the tendon, lying on the guide in such a manner that the middle third of the tendon is included. The emerging thread is passed behind the entering thread of the tendon suture and finally carried forward to the sclera taking a deep hold here and on out through the inner cut edge of conjunctiva. The needle in passing through the tendon is made to impinge directly on the guide to make sure that the whole thickness of the tendon is transfixed. The suture when passed as described is then loosely tied for purposes of easy identification.

The other two sutures for the upper and lower thirds of the tendon are passed in exactly similar fashion, taking conjunctiva, capsular tissue, and tendon, and are then brought forward to the scleral attachment and made to include the cut edge of conjunctiva on the inner side. The sutures being passed the guide is withdrawn. If it be desired to do a tenotomy of the internal muscle it is done at this stage, otherwise the sutures are tightened, the surgeon bearing in mind the desirability of over-correction of the deviation at the time of operation.

Care must of course be taken that the muscle is not advanced further than the tendon suture will allow, *e.g.*, if the line of tendon sutures is only 4 mm. from the insertion of the muscle the muscle can be reattached only at most 4 mm. in front of the insertion, and so on.

In the combined operation, *i.e.*, with tenotomy of the internal muscle, one further advantage of the method may be pointed out. The patient still has the use of the external rectus muscle, which facilitates tenotomy of the internus, and after the tenotomy the exact degree of deviation still uncorrected is evident and can, to some extent, be modified by the amount of the tightening of the external sutures.

After withdrawal of the speculum the eye is again washed with boric lotion and tied up. The writer has not found it necessary to tie up both eyes, even for a limited period.

Daily washing of the conjunctival sac with boric lotion is prescribed and the stitches removed in the simple advancement operation on the twenty-first day, the eye being bandaged for that period. In the combined operation the inner conjunctival suture is removed on the fourth day, the external sutures on the tenth day. The writer hopes in a later communication to report in detail the results of a series of cases.

(The tendon guides are made by Messrs. J. Weiss & Son, Oxford St., W.)

HOLTH'S PUNCH OPERATION FOR GLAUCOMA.

BY

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PROBABLY, to-day it is universally recognised that the operation of iridectomy, although it has rendered excellent service in the past, is not devoid of danger in cases of acute glaucoma, and may be useless, or even harmful, in the chronic form of the disease. So much is this the case that most surgeons undertake the operation with some anxiety, and experience a feeling of relief when it has been successfully completed.

Since the time of de Wecker, ophthalmologists have devoted themselves to the task of devising and perfecting operations which shall be less dangerous and more certain in their action than iridectomy, and I think we may say that success has been achieved, and that the surgeon has now the choice of several methods for relieving tension which are reasonably safe and certain in their effect. These procedures fall naturally into two classes, namely, sclerotomies and sclerectomies. Elliot now prefers to call his operation a "sclerostomy." The only sclerotomy I have tried is the Herbert small-flap operation. My experience has been that if the operation be performed neatly, the incisions heal up firmly in a very short time, and in consequence the effect in lowering tension is apt to be transient. The healing may be so perfect that it is difficult to locate the site of the operation. For this reason I now never adopt this procedure. It may be useful in cases where only a minimal effect is desired and where any operation is more risky than usual. I performed it recently in a case of glaucoma associated with diabetes and retinal hæmorrhages, because it seemed to me to be the operation which exposed the eye to the least risk. The effect lasted only for a few weeks, and ultimately I had to perform sclerostomy by Holth's method. This operation was also a failure, because the piece of sclera I excised was too small. In another case, in which iridectomy had been done twelve years ago, vision had been well maintained, but recently there were occasional attacks of slight rise of tension with œdema of the cornea. The Herbert operation was performed, and has for the past six months been sufficient to restore the balance between excretion and secretion which had become slightly deranged.

In my opinion, there are two factors necessary for a safe and effective glaucoma operation: firstly, the incision must be a small one and, secondly, a piece of sclera must be removed if filtration is to be permanent. Iridectomy is always necessary for reasons which I shall shortly enumerate. I have never tried the Lagrange procedure, because it seems to involve a large incision far back in the eye with its possible dangers, loss of vitreous and intra-ocular hæmorrhage. I reject it because, in my view, its results are more safely attained by the Elliot and the Holth sclerostomies.

After a comparative trial of these two operations, I greatly prefer the Holth method, because in my hands it is easier and more accurate.

In spite of all that has been said by Elliot, and by many other ophthalmic surgeons, I still consider that an efficient trephining operation is a difficult one, and I note with pleasure that G. F. C. Wallis holds the same opinion (THE OPHTHALMOSCOPE, Vol XI, 1913, No. 6, p. 588). His exact words are "excellent as the operation is, I have no hesitation in saying that it is a difficult one." He goes on to say, "a constant good result can be obtained only by most rigidly carrying out the exact details of *technique*." The main difficulty lies in the fact that it is practically impossible to give to a trephine a keenness that can be imparted to a knife of the keratome type. Many trephines cut badly, and, in consequence, more pressure has to be used than is good for a glaucomatous eye. It is not easy to make a trephine start its work in exactly the correct spot. Again, it is by no means a simple matter to split the cornea up in the manner demanded by Elliot, so that the trephine hole lies chiefly or at least half-way in the corneal tissue; in fact, in some cases it is impossible. Kuhnt has pointed out that, under certain conditions, the conjunctiva cannot be reflected back right up to the limbus (*Bericht der Ophthalmologischen Gesellschaft*, Heidelberg, 1912). The chief danger in Elliot's operation lies in the fact that the sclera is cut from without inwards, and in the pressure which has to be made upon a diseased eye. If the trephine be slightly blunt and the sclera unduly tough, this pressure is by no means inconsiderable, and may have something to do with the dislocation of the lens which sometimes follows the operation.

The trephined disc is apt to enter the eye, and is then extracted only with difficulty. Elliot says that it can only be washed out, but I shall never forget the trouble I had in removing the disc from one of my cases in which it entered the anterior chamber and lay upon the iris. Such a complication cannot occur when the disc is punched out.

Elliot, during the discussion which followed the reading of the main substance of this paper at the Brighton meeting of the British Medical Association in July, 1913, said that he considered that the introduction of a keratome into the anterior chamber was very difficult and dangerous. It must be admitted that there is a danger, but it is common to all operations in which a keratome is used, and is one that every ophthalmic surgeon is aware of. If a man cannot use a keratome without wounding the lens, he should not operate upon the eye at all. The real difficulty is in deep-set eyes to avoid touching the lid-edge with the base of the keratome. If the anterior chamber were very shallow, I should perform the Elliot rather than the Holth operation.

My earlier operations were performed with Holth's modification of Vacher's punch, but it always seemed to me to be a somewhat clumsy instrument, too massive for the delicate work it has to do. Fig. 1 shows a new pattern of the same punch which has been made for me by Messrs. Weiss & Sons, of London. It is much slighter in build than the original model, but it has proved amply strong for its duty. Holth has seen this improved instrument, and he tells me that he prefers it to the old pattern. Holth describes a small stopped keratome which he employs to make the incision. This makes a wound which is unnecessarily large. I originally used Bell Taylor's bent broad needle. This is a shade too narrow and too long. Fig. 2 shows the instrument I now use which has been made for me by Messrs. Weiss & Sons.

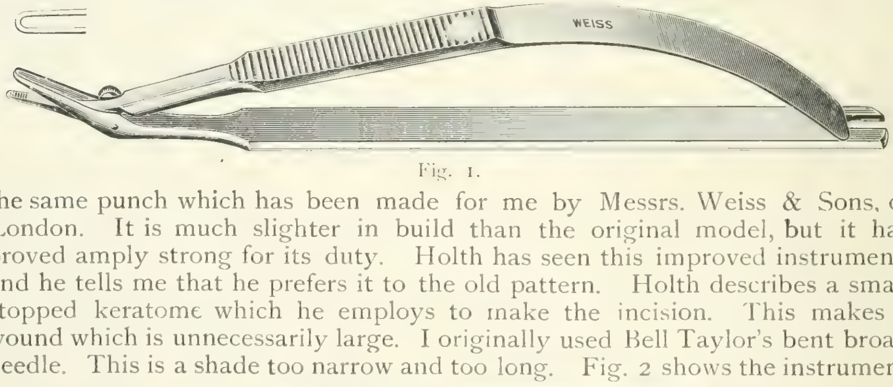

Fig. 1.

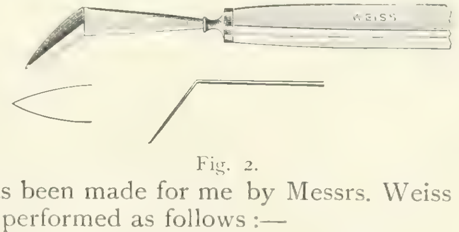

Fig. 2.

The operation is performed as follows:—

If the eye be inflamed, the patient is anæsthetised with gas and ether administered with Clover's inhaler. I dislike chloroform and never use it for my cases. Generally, however, I use a 4 per cent. solution of cocaine, instilled four times at intervals of five minutes. With the first instillation, I give a few drops of 1 per cent. solution of eserine sulphate. The lacrymal sac is previously syringed out, to exclude dacryocystitis, and if the conjunctiva be at all abnormal in appearance, cultures are made to determine the nature of the bacterial contents of the sac. The eye is douched with a solution of oxycyanide of mercury, 1:5,000, and the lashes are cut short. The lids,* and especially their edges, are washed with ordinary soap and water, and then well rubbed with a swab which has been dipped into a solution of biniodide of mercury, 1 : 500, and squeezed till no more of the fluid can be expressed. The speculum is now inserted, and the usual Elliot flap cut and reflected down to the limbus with squint scissors. I then split the cornea with a small scalpel as far as was usual in *the older Elliot operation*. I split it far enough to bring my opening close to the cornea, but not necessarily into it. The flap is held down with fine forceps which have no teeth, and the point of the knife entered at a spot 1½ mm. from the limbus. The flap is replaced over the knife by the assistant, and the instrument is pushed forward till its point is seen in the anterior chamber. The point of the keratome may catch in the iris and produce a slight iridodialysis. This is, I think, an advantage, because it helps to clear the iridic angle, which is desirable in glaucoma. The patient must then look down while the punch is inserted slowly and the scleral disc punched out. It must be noted that the cutting blade is underhung, so that the lower (female) blade must be passed in further than may appear to be necessary. A D-shaped orifice results which should just include a portion of the cornea. If any iris prolapse, it should be seized and excised. Otherwise, if an iridectomy be desired the iris should be withdrawn with Liebreich's (Matthieu's) forceps. The flap is finally replaced and held in place with a suture. For some time I gave up the suture, but the bad results obtained have decided me to revert to its use. The eyes are covered with a double pad for forty-eight hours, and then inspected. If there be any undue injection, atropine is instilled. After forty-eight hours, I often leave both eyes open, using a large shade to exclude glare.

When I read the paper (of which this is an amplification) at the Brighton Meeting of the British Medical Association, I had performed the operation fifteen times. I have now increased the number of cases to twenty-nine, and further experience has led to a slight modification of my views.

As mentioned above, in some of my operations I did not suture the flap. I found that a bare surface was left which took some time to cicatrise over. The resulting scar tissue cannot favour free filtration. One of my recent cases, however, convinced me that the sutures were absolutely necessary. At the first dressing, 48 hours after the operation, I found that the flap had curled down over the cornea leaving the hole exposed. I gave an anæsthetic, and sutured the flap in place. The patient was very alcoholic, but no infection took place and the result was good. I shall in future never omit the sutures.

I hold that iridectomy, basal or complete, is necessary for three reasons. If it be omitted, the iris may prolapse into the hole and block it. This actually happened to one of my patients, and it will be necessary to repeat the operation. Thomson Henderson has shown that the cut iris never heals and he believes that it acts as a sort of wick, allowing the aqueous to enter its lymph spaces and reach the channels of exit. For this reason, therefore, I prefer to add the known benefits of iridectomy to my filtering scar. Finally, Holth showed some specimens to the Heidelberg Congress last year (1913)† which demonstrated the fact that a fistula may be kept permanent because it is lined by pigment cells derived from the cut iris. The iridectomy seems necessary to allow these cells to escape. My experience so far is that the cases in which I have added iridectomy to the sclerectomy are more satisfactory than those without iridectomy. I now only use scissors to reflect the flap until I expose the limbus and see the glans penis-like elevation described by Elliot. It is unnecessary to split the cornea with a knife.

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* I now simply paint the lids and lid margins with tincture of iodine.

† See page 347 of the present number of THE OPHTHALMOSCOPE.

On one occasion I button-holed the flap just over the orifice, but I sutured it up and no trace of the rent can now be seen.

The short keratome I use is unlikely to touch the lids, but to render such contact harmless, I tuck the edge of the gauze which covers the patient's face under the top limb of the speculum and so cover the upper lid with a sterile substance.

Only six of the twenty-nine operations have been failures, and four of those failures were due to defective *technique* and will not, I hope, recur.

Two were due to the fact that the piece removed was too small.

One case failed to filter because the hole was eventually blocked with iris. It was satisfactory for about three weeks.

In another case I entered the keratome too far back and removed an unnecessarily long piece of sclera. Some vitreous prolapsed, and in consequence there was no filtration. This case had a tragic sequel. I repeated the operation, which appeared to be a perfect one, but the same night the patient became wildly maniacal and bit one of the nurses and the house-surgeon. The latter gave him half a grain of morphia by injection. This had no result, so in half an hour the injection was repeated. The patient died next day from exhaustion, perhaps helped by the depression caused by the morphia. The *post-mortem* examination showed that most of the cerebral arteries were in a state of advanced calcification and that his kidneys were highly cirrhotic.

Another case showed free filtration, but the tension was not reduced.

The last failure was, perhaps, a case of late infection. Considerable iritis followed the operation, which, however, was a complete succcess for six months. The eye which had been in a state of acute glaucoma became soft and good vision returned. The patient was a careless, alcoholic woman. Six months after the operation, her lid was stung by a wasp, but she did not appear for some weeks after this complication, when I found that all filtration had ceased, the scar was yellowish, and the iris inflamed. A chronic iridocyclitis continued for some weeks, and eventually all sight disappeared.

Only three of my cases have shown slight iritis, but I now instil atropine solution once at the time of the first dressing.

I have used the Schiötz tonometer for the more recent cases, but up to the present the instrument has disappointed me. The readings are constantly at variance with the clinical picture and with the information afforded by digital palpation. As Wessely has pointed out, it measures two factors, either of which may vary: the intra-ocular tension and the rigidity of the cornea. The tonometer is valuable to measure the tension of one eye against its fellow ; as an absolute recorder of intra-ocular tension I find it is useless—fingers serve me better. But with increasing experience I hope to get better results. I find that private patients do not object to the tonometer, and with them I have got more useful information than in the case of hospital patients. I think that it is better to use a speculum, and that cocaine is more efficient than holocaine.

Finally, I may say that the more I see of Holth's operation and its results, the more I like it. I use it now exclusively for all varieties of glaucoma : acute, subacute, and chronic. I have not yet tried it for buphthalmos, but hope to do so.

Apart from inserting the sutures, it takes one minute to perform the operation.

SUCCESSFUL OPERATIONS.

Name.	Sex and Age.	Tension before	Final Tension.	Vision before	Vision when last seen and time after operation: time in months.	Nature of Glaucoma.	Iridectomy.	Anæsthetic.	Iritis.	Notes.
SUMMERS ...	F. 69	+1	N.	Cataract	Died	Acute	Yes	Ether	Yes	Cataract. Admitted for preliminary iridectomy. Developed acute glaucoma. 4 months later had a paralytic stroke and died. Some iritis after the operation. Relieved by Behring's serum and atropine.
OLORENSHAW...	M. 57	+1/2	N.	6/60	6/36 VI	Chronic	No	Cocaine	No	Cataracta punctata.
EDWARDS ...	M. 45	+1	N.	Fingers	Fingers	Chronic	No	Cocaine	No	Pupil a little drawn up towards hole.
SHEASBY ...	F. 62	+3/4	N.	6/60	6/9 III	Sub-acute	No	Ether	No	Admitted for corneal ulcer. Developed subacute glaucoma from the atropine, tension rose to + 3/4, vision sank from 6/9 to 6/60. Hyperæmia after operation which lasted for a month. Operation deferred because the conjunctival sac contained pneumococci. Sterile at time of operation. Complete cure V=6/9 again.
HANCOCK ...	F. 77	+1	N.	No P.L.	No P.L.	Chronic	No	Cocaine	No	Four days after the operation, which was perfectly successful in relieving pain and tension, patient became deluded. She went home and died ten days later.
ROBERTSON ...	M. 67	+1	—1	5/ 0	6/24 III.	Acute	No	Ether	Yes	Four years previously I did an iridectomy for fulminating glaucoma. This cured the glaucoma, but no vision returned. Became demented and remained so for six months. In consequence, the other eye, which had shown signs of subacute glaucoma, was successfully treated with pilocarpine. The acute attack in the second eye was associated with a slight nuclear cataract. The operation was completely successful.

Name.	Sex and Age.	Tension before.	Final Tension.	Vision before.	Vision when last seen and time after operation: time in months.	Nature of Glaucoma.	Iridectomy.	Anæsthetic.	Iritis.	Notes.
MILLIGAN ...	F. 58	+1.5	—1/2	6/60	6/36 XI.	Sub acute	Yes	Ether	No	Case treated with atropine by another doctor. At time of operation and after it there was no cupping of the disc, but during the next year, although the T. was never + and generally —, the disc became markedly cupped. Good filtration at end of a year.
KELSEY ...	M. 71	+1	—1/4	Fingers 1 metre	hand reflex XVIII.	Chronic	No	Cocaine	Present before operation	Corneal ulcer with iritis and glaucoma. Operation after healing of ulcer two months after first visit. No cupping of disc. Developed chronic glaucoma in second eye, but refused operation.
DUNN	F. 57	+1	N	Hand reflex	6/60 XIII.	Acute	Yes	Ether	No	
DUNN	F. 57	+1.5	N.	Percep. light	6/36 IV.	Acute	Yes	Ether	No	Five months previously a punching operation was done (*see* "Failures") because the vision was failing and field contracting. A very small piece of sclera was removed with no iridectomy. The hole healed up and no filtration took place. Acute glaucoma came on five months later.
SHAW	F. 72	+1	Notes	incomplete		Sub-acute	—	Ether	No	The operation successfully relieved the high tension and patient left the hospital with a quiet eye. When written to she replied that she was too infirm to come up for inspection, but added that she had very little sight left.
SMALLEY ...	F. 70	+1	—1/2 II.	2/60	6/60 II.	Chronic	No	Cocaine	No	
SMALLEY ...	F. 70	+1	—1/4 II.	2/60	3/60 II	Chronic	No	Cocaine	No	
HOLT	F. 35	+1	+1/4 I.1/2	Hand movements	6/18 I. 1/2	Chronic	No	Cocaine	No	Flap rolled back and exposed the hole in which vitreous presented, but did not escape. Sutured 6 days later, when the second eye was punched. No infection. Alcoholic. The improvement in acuity is noteworthy.

HOLT	F. 35	+1	—1/4 I.	6/60	6/18 I.	Chronic	Yes	Cocaine	No	
PEPLOE ...	F. 56	+3/4	N. II.	5/36	6/36	Chronic	No	Cocaine	No	
TEDDS	M. 46	+2	T.—1/4 II.	No P.L.	No P.L.	Acute	No	Ether	Present before operation	Came up with very acute glaucoma and iritis. No view of fundus. Later, after operation, fundus examined, and fully detached retina seen. Intra-ocular tumour suspected. Eye excised. Tumour present.
ROLLASON ...	F. 59	+1.5	—1/4 III.	Hand reflex	6/18	Acute	No	Ether	No	The other eye had been trephined three years before. No iridectomy had been done, but the operation was technically perfect. The filtration when last seen was poor, T.+3/4.
JENKINSON ...	M. 64	+1	N	6/24	6/24 Recent case	Chronic	Yes	Cocaine	No	Too recent a case to give details of vision.
JENKINSON ...	M. 64	+1	N.	Hand reflex	Fingers at 1 foot.	Chronic	Yes	Cocaine	No	
CROSS	M. 50	+1.5	N,	No P.L.	No P.L.	Chronic	Yes	Cocaine	No	Glaucoma due to adherent leucoma. Operation for relief of pain. Very satisfactory
"FRANCIS" ...	F. 52	+1	N. II.	Fingers	Improved	Chronic	Yes	Cocaine	No	

UNSUCCESSFUL OPERATIONS.

Name.	Sex and Age.	Tension before.	Tension after in months.	Vision before	Vision after in months.	Nature of Glaucoma.	Iridectomy	Anæsthetic	Iritis	Notes.
DUNN	F. 57	N	—1/4 III	6/12	6/12 III	Chronic	No	Cocaine	No	Five months later developed acute glaucoma.
SMITH	M. 64	+1	+1/2 X.	0	0	Chronic	No	Cocaine	No	An excellent filtering bleb formed, but tension never fell and varied between +1 and +1/2.
LANDER	F. 51	+1	N. VI.	6/18	0 VI	Sub-acute	Yes	Ether	Yes	Very alcoholic. Some iritis after operation. Five months after the operation stung by a wasp on the eyelid. The resulting conjunctivitis was followed by an acute irido-cyclitis which eventually blocked up the hole. The vision had, however, sunk to 0 within two months of the operation.

Name.	Sex and Age.	Tension before.	ension after in months.	Vision before.	Vision after in months.	Nature of Glaucoma.	Iridectomy.	Anæsthetic.	Iritis.	Notes.
Twaites ...	F. 52	+1/2	+1/2	3/60	Percept. of light.	Chronic	No	Cocaine	Present before operation	Alcoholic. Severe diabetes with retinitis and retinal hæmorrhages. Developed iritis which was followed by chronic glaucoma. A Herbert small flap operation was performed but no filtration resulted. The punch operation had no result, there was no filtration. The piece removed by the punch was very small, as intra-ocular hæmorrhage was feared, if the tension was too much reduced.
Anker	M. 76	+1	+1 I.	3/60	6/60 I.	Chronic	Yes	Cocaine	No	At first operation a drop of vitreous followed the iridectomy. When the patient left the hospital T= —2 with a good filtering scar. A week later T. rose and never fell below + 1. Six weeks after first operation the eye was repunched at the side. Smooth operation, no loss of vitreous. The same evening the patient became acutely maniacal. The House Surgeon gave him gr. 1/2 of morphia. This had no effect so in half an hour the injection was repeated. Twelve hours later he died of exhaustion.
Anker	M. 76	+1	Died	3/60	Died	Chronic	Yes	Cocaine	No	
Overton ...	M. 76	+1/2	+1/2 II.	6/36	6/36 II.	Chronic	No	Cocaine	No	Left Hospital with T—2. Later a pad of iris prolapsed into the hole and all filtration ceased and tension rose to +1/2. Probably the operation will have to be repeated.

Six Operations out of 29, or 20·7 per cent., were failures.

One, from late infection.
Two, because the piece removed was too small.
One, in spite of good filtration the tension did not fall.
One, because the aperture was blocked by iris tissue.
One, because the aperture was blocked by vitreous.

Two cases developed mania and died.
One case has been melancholic after an iridectomy for acute glaucoma, but the conditions did not recur after the second eye was "punched."

In two cases the use of a mydriatic may have been responsible for the glaucoma.
Only three cases developed slight post-operative iritis.

CLINICAL MEMORANDA.

A CASE OF DEATH FOLLOWING OPEN EVISCERATION.*

BY

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HON. SURGEON ROYAL EYE HOSPITAL, MANCHESTER; HON. OPHTH. SURGEON CHILDREN'S HOSPITAL, MANCHESTER; LECTURER ON CLINICAL OPHTHALMOLOGY, THE UNIVERSITY OF MANCHESTER, ENGLAND.

THE patient, T. F., male, aged forty-seven, was, on the 27th February, 1906, struck by a chipping of hot metal on the right eye. A few days later he was admitted into the Royal Eye Hospital, Manchester, under the care of Dr. Emrys-Jones, to whom I am indebted for the notes taken at that time.

The upper half of the cornea was ulcerated, the base of the ulcer was infiltrated with pus, and a hypopyon half-filling the anterior chamber was present. On March 9th, a section of the cornea was done below, but in spite of the operation and other treatment, the ulcer extended and involved the upper two-thirds of the cornea. Eventually, the destructive processes ceased, and a dense leucoma formed.

Seven years later, on October 2nd, 1913, he presented himself again at the Hospital, and was admitted under me, with signs of early panophthalmitis. There was much injection and swelling of the ocular conjunctiva, and the leucoma was moderately staphylomatous. There was no perception of light, and the intra-ocular tension was full. When examining the patient, the idea of the risk involved in enucleating such an eye, and the usually admitted advantage and safety of evisceration, crossed my mind.

Four days after admission, *i.e.*, on October 6th, at my direction, Dr. H. V. White, the resident surgical officer, performed the operation of open evisceration by cutting away the cornea and scooping out the whole of the ocular contents.

The next day, October 7th, the stump was satisfactory.

On October 8th, the patient became somewhat rambling in his speech. I saw him, and noted a vacant expression on his face and lack of attention. I directed a general examination to be made, and, if necessary, removal to a general hospital.

During that night he became very restless. The temperature was 99°F., pulse regular, but the breathing was rapid. No physical signs of pneumonia were present. A diagnosis of post-operative mania was made, and at 5 p.m. on the 9th October, he was removed to the Union Infirmary. His mental symptoms were such that he was placed in the ward for acute mania cases. He died at 1.30 p.m. on the 10th.

An inquest was held, and by the direction of the coroner, a *post-mortem* examination was made by Mr. E. D. Telford, whose report was as follows:—

The body was that of a well-nourished man, presenting no external signs of disease or injury beyond the condition of the right globe. This had been eviscerated, and the cavity of the shrunken globe was half full of thick gummy pus. There was no evidence of inflammation in the conjunctiva, cellular tissue of the orbit, or lids.

On opening the skull, the surface of both cerebral hemispheres was seen to be intensely injected and covered with a thin layer of greenish-yellow pus; these changes were more marked on the frontal lobes. On dislocating these lobes, their under surface was found to be thickly covered with similar pus.

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*Read at meeting of the Ophthalmological Society U.K., April 25th, 1914.

The optic nerve of the right side was considerably swollen, and showed many minute vessels on its surface. On cutting it across at the foramen, a bead of pus exuded at once from the cut surface of the distal portion. There was no evidence that any pus had reached the brain through the sphenoidal fissure.

The left optic nerve was normal.

The whole of the base of the brain was bathed in thick pus, and the inflammatory changes were most marked about the chiasma and the floor of the third ventricle. Beyond a slight increase of clear fluid, there was nothing abnormal in the internal passages of the brain. There was no evidence of any ear disease and the result of the examination was to show clearly that the infection had reached the meninges *via* the optic nerve.

With the exception of slight congestion of the bases of the lungs, the other organs of the body were entirely healthy.

Comments.

The operation of open evisceration for panophthalmitis has always been considered almost free from the risks incurred in enucleation, after which procedure death has not infrequently been reported.

On looking through the records of my own cases from November, 1899, to the present day, I find I have had thirty-four cases of complete purulent panophthalmitis due to all causes, of which 11 are credited to 1913. I purposely exclude the numerous cases of uveitis, chiefly of traumatic origin, with merely local exudations, or even actual small formations of pus, where evisceration has been performed, with or without the insertion of a glass globe.

Out of the thirty-four a satisfactory recovery with the formation of a small hard stump, the remains of the shrunken sclera, has resulted in twenty-seven. In six cases the recovery has been much more protracted, owing to sloughing of the sclera, noted at intervals of from 10 days to 3 weeks after the operation: the sloughing is evidently the result of thrombosis of the scanty blood-vessels supplying the sclera.

Lastly, completing the thirty-four cases, is the one case of death by purulent meningitis just described, where pus in the scleral cavity evidently tracked backwards along the inside of the optic nerve itself.

A METHOD OF EXAMINING LARGE DETACHMENTS OF THE RETINA.

BY

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A SHORT time back I was examining a patient with a large detachment of the retina, with an ophthalmoscope in the usual way, for the purpose of ascertaining the exact size and situation of the detachment; my object was to determine the best spot for trephining, in order to let out the sub-retinal fluid. The pupil was dilated, and it occurred to me to use a transilluminator, and to look at the detachment with a Zeiss' corneal *loupe*. I found, to my surprise, that I obtained a most extraordinary view of the fluid swelling; every detail of its contour was obvious; its size and its extent could be very easily ascertained, and the correct spot for the trephining could be determined without the least difficulty.

The method seems so obvious that it occurs to me that others may have used it; but I can find no record of such a thing having happened. The method is very simple, and it has only to be tried for its usefulness to be appreciated.

CASE OF A FUNGATING, BLEEDING, ROUND-CELLED SARCOMA, WHICH ORIGINATED FROM THE LEFT ORBIT

BY

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THE patient was a boy, 14 years of age, who was admitted to the Ophthalmic Department of the Glasgow Royal Infirmary on 11th September, 1909. Two months previously he had received a blow on the left eye, but as the resulting swelling and ecchymosis soon disappeared, he thought little of it until a week before admission, when he noticed that the eye was becoming prominent. The lids were red and swollen, but there was no pain. When he was brought to the Hospital the proptosis was so great that the globe could not be covered by the lids, which were stretched and swollen and of a livid red colour. The ocular conjunctiva was chemosed, and secreted muco-purulent discharge.

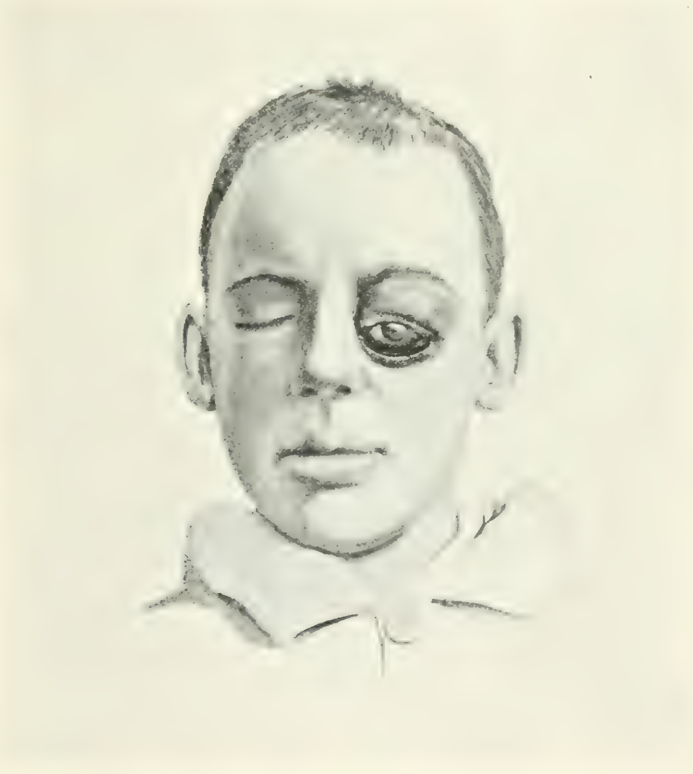

Fig. 1.

The cornea was steamy throughout its whole surface, in part ulcerated, and manifestly acutely infected. The iris could be seen, and the pupil was circular and active. No fluctuation could be made out, but palpation caused much pain, and it was not possible to push the ball back into the socket (Fig. 1). The temperature was 103° F., the pulse was small and rapid, and the tongue was dry and furred. The right eye was unaffected, and vision with it was normal.

Swelling of the lids, chemosis, and exophthalmos, are signs which at once suggest cellulitis or abscess of the orbit. That is all the more probable when, as in the present case, those symptoms are confined to one side, are rapid in their onset, follow an injury, and are accompanied by a rise in temperature. At first therefore the patient was supposed to be suffering from abscess of the orbit, although the absence of pain and inability to detect fluctuation cast considerable doubt on the accuracy of the diagnosis. When an exploratory incision was made into the orbit at its outer aspect, no pus was found, but there was violent hæmorrhage, which was controlled with great difficulty. On the day following the operation, the temperature fell to normal, and the patient said that his eye felt much more comfortable. The proptosis, however, was steadily increasing, the cornea had sloughed, and signs of panophthalmitis had appeared. The globe was therefore eviscerated, but the operation had no effect on the progress of the disease, for the orbital contents increased perceptibly day by day. It became necessary therefore to reconsider the diagnosis. That no pus

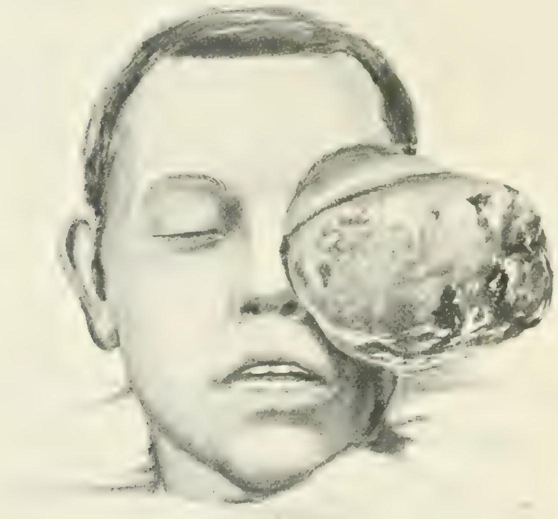

Fig. 2.

was found after a thorough exploration of the orbit, that violent hæmorrhage followed the operation, and that the patient from the outset had suffered no pain, were facts which, while they negatived the probability of the existence of an abscess of the orbit, strongly supported a diagnosis of a rapidly growing orbital tumour.

The subsequent history of the case proved that this opinion was correct. A large globular mass surrounded the remains of the eviscerated eyeball. Its greatest bulk was at the upper aspect of the orbit, so much so that the shrivelled globe looked downwards much more than forwards. As the tumour grew, the stretched and widely separated lids gripped it tightly, so that at its exit from the orbit it was somewhat constricted. When, however, it got free from the pressure of the lids, it bulged, to form a large globular mass, livid red in colour, of soft consistence, ulcerated on its surface, discharging freely, and bleeding violently on the slightest injury. The hæmorrhage was sometimes very alarming, and on three separate occasions, while the tumour was being dressed, the patient fainted from loss of blood. As the growth increased it overlapped the cheek, and reached in the end almost to the level of the mouth (Fig. 2). The patient became so anæmic and emaciated that no operation was attempted. He however gave evidence of wonderful vitality, for in spite of hectic fever, which at times raised the temperature to 104°F., he lived for five months from the time when the protrusion of the left eyeball was first observed.

Some weeks before his death the patient was removed from the eye to the septic wards of the infirmary. While he was there Dr. Quintin McLennan passed a ligature round the tumour, and separated a mass weighing about one-and-a-half pounds.

A *post-mortem* examination was not allowed, but a piece of the tumour was examined microscopically by Dr. Mary B. Hannay, who reported that it was a typical round-celled sarcoma.

A CASE OF FOREIGN BODY IN THE IRIS OF LONG-STANDING DURATION.

BY
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J. H., *æt.* 30 years, a plumber, consulted me on September 25th, 1912, about the condition of his right eye, stating that seven or more years ago, while repairing a gutter, he was struck in the eye by an iron chipping. The eye watered, and was painful for a short time, but did not give him sufficient discomfort to cause him to seek medical advice. Since the accident he has had repeated attacks of inflammation of varying severity in the eye. These attacks are always coincident with cold winds and weather, and have always subsided without affecting the vision. He has undergone treatment for them, but without permanent benefit.

On examining the eye, a small corneal scar was perceptible above and quite near the limbus. In the middle of the iris, and situated about 12 o'clock, was a small, brownish, slightly elevated mass, having an irregular surface, and beneath this mass, at the pupillary edge, was a posterior synechia. The media were quite clear, the fundus oculi was normal, and the vision was 6/5 and J.1.

The left eye was perfect in all respects.

I diagnosed a foreign body in the iris, and proposed operation, but the patient elected to wait for a time.

I next saw him on January 21st, 1913. The eye had been inflamed for a week, and he had been using atropin. The picture was that of an acute subsiding iritis with a wide pupil. I prescribed suitable treatment, and again advised operation when the eye had reached a quiescent state. In fourteen days the eye was quite quiet, but he deferred the operation, and in April, 1913, he had another attack of iritis, which lasted about fourteen days.

On June 17th, 1913, he was admitted to the Manchester Royal Eye Hospital and a radiogram revealed the presence of a foreign body.

On June 19th, under cocain anæsthesia, I made a small limbic section above with a Graefe knife and removed the foreign body with forceps, excising the iris which included it. He made an uninterrupted recovery, the section healing without inflammatory reaction.

The foreign body was a small iron scale, strongly magnetic, and speckled with red owing to oxidation.

Subsequent History.—August, 1913. Vision = 6/6 and J.1. Eye normal except for small complete coloboma of iris above.

May, 1914.—The patient has had the most comfortable winter he has passed for some years, having been quite free from iritic attacks ; there is very slight dazzling at times in bright light.

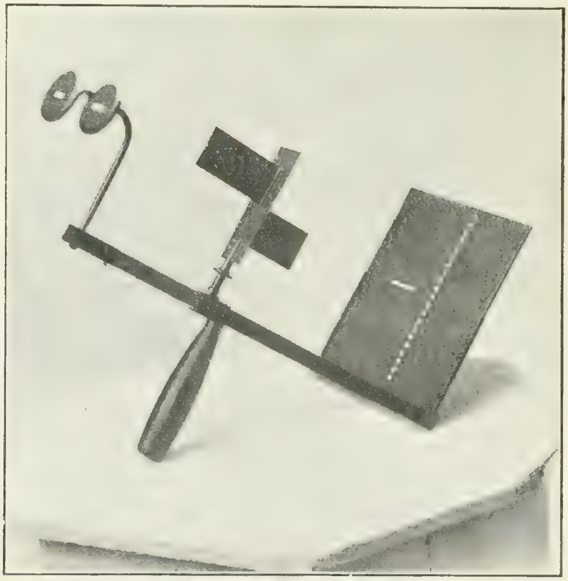
The points I wish to emphasize are :

1. The length of time which an iron particle can remain embedded in the iris without causing destruction of the ocular tissues by siderosis ; in this case the eye was unaffected and the vision excellent.

2. The periodic attacks of iritis which were always brought on by cold winds and weather.

NOVELTIES.

THE MADDOX "WING TEST" FOR HETEROPHORIA.



THIS instrument, made by Mr. Sidney P. Holloway, of Bournemouth, measures every variety of muscle balance under reading conditions, quickly and accurately. It is available even in poor artificial light. It contains no lenses or prisms but the eyes look through two horizontal slits. A line of fine print enables accommodation to be maintained.

For measuring horizontal deviations, it makes use of the well-known tangent scale and arrow. Dissociation of the eye is effected by screening the arrow from one eye and the scale from the other, with horizontal wings. These divide the visual field into upper and lower halves, which glide laterally, so that the arrow in the lower appears to move, until opposite to that figure in the upper which records the deviation.

For measuring hyperphoria, a similar scale, arranged vertically, is used, and an upright screen divides the field into right and left hand halves.

For amblyopes, a metal arrow, which can be moved by the surgeon until apparently opposite the printed one, makes the reading of figures unnecessary.

For the measurement of cyclophoria, there are stretched across a black surface two white elastic threads, one of which is seen by each eye. These can be adjusted by patient or surgeon until they appear parallel, and the amount of deviation determined from a scale. The threads can be used vertically or horizontally.

CURRENT LITERATURE.

NOTE.—Communications of which the titles only are given either contain nothing new or else do not lend themselves to abstract.

I.—LOCAL ANÆSTHESIA.

(1) **Morgenroth, J., and Ginsberg, S.—The mechanism of corneal anæsthesia. (Ueber den Mechanismus der Cornea-Anästhesie.)** *Centralbl. f. prak. Augenheilkunde,* Oktober, 1913.

(2) **Reinflet.—Local anæsthesia in ophthalmology. (De l'anesthésie locale en ophtalmologie.)** *La Clinique Ophtalmologique,* 10 mars, 1914.

(3) **Ramsay, A. Maitland.—The use of omnopon-scopolamine combined with local anæsthesia in ophthalmic surgery.** *Lancet,* April 25th, 1914.

(1) This very interesting paper by **Morgenroth** and **Ginsberg**, of Berlin, is of much greater importance than the title would appear to indicate. It is based upon a series of experiments on the corneæ of rabbits with the alkaloids of quinine, such as hydroquinine ethylhydrocuprein. The salts of these alkaloids in solution have a strong anæsthetic effect upon the cornea. The hydrochlorates of the higher homolog of this series (isopropyl, isobutyl, and isoamylhydrocuprein) have a very much more marked anæsthetic effect. Experiments were made to determine the anæsthetic effect of solutions of the bases themselves in olive oil, and it was found that these oily solutions were very powerful indeed. For instance, a 2 per cent. solution of isoamlyhydrocuprein produced complete anæsthesia of the cornea in from 2½ to 6 minutes, which lasted in different animals from 6 hours to 7 days.

The authors then discuss the mechanism of this phenomenon. The watery solutions of the salts are, of course, easily taken up by the conjunctival fluid, and conveyed through the epithelium to the nerve-endings. But the alkaloidal bases themselves are soluble only to an extremely slight degree in water, and the alkaline nature of the conjunctival fluid must still further greatly reduce this solubility. The layer of oil must be separated from the corneal epithelium by a very thin layer of watery fluid which must act as the medium of conveyance of the drug. The prolonged effect can be explained by the continued action of this layer of fluid taking up the alkaloid from the oily solution, and passing it on to the corneal epithelium. This action may be aided by the formation of a micro-emulsion.

The authors have attempted to perform a physiological experiment upon these lines of transference of material. To 15 ccm. of a 5 per cent. mixture of goat's blood cells in 8½ per cent. cane sugar solution is added 1 ccm. of a 3 per cent. solution of ethylhydrocuprein hydrochloride. This is kept in the ice chest for twenty hours—the cells are then well agglutinated—and centrifugalized. The supernatant clear fluid is removed, and the sediment suspended in a small amount of this fluid (about 1.5 ccm.) and then these two are separately examined. The supernatant fluid produces practically no corneal anæsthesia, the emulsion of blood cells produces a very strong anæsthesia. The importance of such an experiment will at once be evident if one thinks of what happens when one introduces soluble drugs into the blood stream. The formed elements may have a very important function in transferring such drugs from the plasma to the organisms or cells of the various organs. A. LEVY.

(2) The article by **Reinflet**, of Paris, is mainly concerned with enucleation under local anæsthesia. The author first reviews what has been done by means of local anæsthesia, especially by Reclus, Meyer, Terrien, Jocqs, Haab, Brunetière, and Siegrist, and then details his own *technique* and experience. The anæsthetic which he employs is novocaine. This must be in weak solution, but in considerable bulk, and considerable time, namely, half an hour at least, must be allowed for thorough anæsthesia to take place. The following is the formula of the solution :—

Novocaine	0 grm. 20.
Adrenaline 1 to 1,000	5 drops.
Sterilised physiological serum q.s.p. ...	20 cc.

This solution is to be made up fresh at the time of operation and must not be boiled. Although aqueous solutions of novocaine can be boiled without decomposition, the author does not recommend it. In any case, boiling after the addition of the adrenaline destroys the properties of the liquid. Prepared *ampoules* are of no service. The method of injection is somewhat elaborate. Firstly, the conjunctiva is anæsthetised by a few drops of the solution. Secondly, four subconjunctival injections of half of one cubic centimetre each are made at the insertions of the recti. Thirdly, four deep injections are made by passing a five centimetre long, strong, curved needle round the eyeball to the retro-bulbar region. If the eye is uninflamed, one must then wait thirty minutes ; if inflamed, forty-five minutes. Enucleation can then be performed absolutely without pain. The quantity injected, namely, four cubic centimetres of 1 per cent. novocaine with one drop of adrenaline, can do no harm at all. It is not necessary that the patient be fasting He should be operated upon in a horizontal position, and this position should be maintained for several hours afterwards. Only a light and fluid diet should be allowed on the day of operation. The method is suitable even for eyes in a condition of panophthalmitis. ERNEST THOMSON.

(3) In this article **Ramsay**, of Glasgow, deals with his experience with omnopon and omnopon-scopolamine associated with local anæthesia in eye operations. He has used omnopon-scopolamine as an adjuvant to local anæsthesia in cataract extraction, irido-sclerectomy, plastic operations, extirpation of the lacrymal sac, and in enucleation. The cataract cases in

which he employed the method were abnormally nervous and restless. In such cases, while the drug in no way facilitated the operation, since it made the patient too drowsy, the after-effects were all that could be desired, owing to the soporific effect. No period of excitement prevents sleep and neither pulse nor respiration is markedly affected. The average dose for an adult is 2/3 grain of omnopon and 1/150 grain scopolamine. Ramsay injects into the muscles of the gluteal region. ERNEST THOMSON.

II.—AFFECTIONS OF THE EYE AND LABYRINTH.

(1) **Rönne, Hanning.—Paralysis of voluntary lateral conjugate movements, with preservation of reflex movements referable to the semi-circular canals. (Ueber assoziierte Blicklähmung der willkürlichen Seitenbewegungen, aber mit erhaltenen Reflexbewegungen, von den Bogengängen ausgelöst.)** *Klin. Monatsbl. f. Augenheilkunde*, November, 1911.

(2) **van der Hoeve, J.—Eye affections in congenital family deafness and in diseases of the labyrinth. (Augenanomalien bei kongenital-familiärer Taubheit und bei Labyrintherkrankungen.)** *Klin. Monatsbl. f. Augenheilkunde*, April, 1913.

(1) **Rönne**, of Copenhagen, directs attention to the cases reported within recent years, in which the patient cannot voluntarily perform lateral conjugate movement of the eyes, while the same movement can be carried out in a reflex manner. For example, if the fixation object is first placed in the middle line, and the head then passively rotated in the direction opposite to that of the motor defect, it will be found that fixation is maintained; that is to say, the movement which seemed impossible has actually been performed. Bielschowsky's explanation of this phenomenon is that the path from muscle nucleus to cortical centre, which is necessary for the voluntary act, is interrupted, while the track from the semi-circular canals to the nucleus is intact, and forms the afferent side of a reflex arc. Movements of the head set up currents in the fluid contained in the canals, such as are normally associated with certain directions of movement, and these in turn excite reflex movements of the eyes. The experiments of Barany, in which nystagmus is produced by the instillation of cold or hot water into the ear, or by repeated rotation of the patient in a given direction, depend on the existence of and are employed by aurists as a test of the soundness of this arc.

Rönne describes the following case:

The patient, a female aged 39, began to suffer from severe and frequent headaches in July, 1909. A few months later other symptoms developed. unsteady gait, difficulty with speech, diplopia and defective lateral movements of the eyes, sickness without vomiting, giddiness, fibrillary twitchings in the tongue, weakness of the left side of the body, and intention tremors in the left arm and leg. There were no changes in the reflexes, no sensory disturbances, and Wassermann's reaction was negative. The diagnosis was Disseminated Sclerosis. *Vision* was 5/5, R. and L. *O.E.* was negative. With the eyes in the median position, no diplopia. In lateral fixation, homonymous diplopia, the images being very close together, in the right field the left image higher, and in the left field the right image higher. Convergence almost in abeyance. Light reactions of pupils good. Dextro-rotation of the eyes to order, slow but complete, and return slow. Rotation towards a fixation object in right field showed same features. Rotation of eyes to the right easily and rapidly performed, if the object was first fixed in the median position, and then carried to the right, or the object kept at rest and the head rotated to the left. Lævo-rotation of the eyes to order impossible. Movement towards a fixation object in the left field not obtained. Fixation object carried from middle position to left side could be followed if the movement was slow, not if quick. Fixation of an object first observed in mid-position could be easily maintained, when head was rotated, even smartly, towards the right. No defect of up-and-down movements. Irrigation of right ear with cold water caused spastic deviation of both eyes to the right, instead of nystagmus to the left, as in normal cases, and a corresponding inversion of the the normal responses to Barany's test, was elicited by the use of warm water and by rotation of the patient, the results being practically identical on the two sides.

The pronounced dissociation between voluntary and reflex movements in this case indicates the presence of a supranuclear paralysis of conjugate lateral movement. An interesting point in the case is the character of the vestibular reflex. Where one would, under normal conditions, expect nystagmus, the response was a spastic deviation in the opposite direction. This phenomenon has an important bearing on the explanation of the normal reflex. The nystagmus elicited in Barany's test, when the eyes are turned to the right, is to be looked upon as the result of a reflex tonus of the lævo-rotators, insufficient to cause a deviation to the left, but enough to interfere with normal rotation to the right. The same applies *mutatis mutandis* to the other tests. An analogue is found in the fact that when the conjugate deviation caused by cerebral hæmorrhage is passing off, the persistence of the tonus which caused it is manifested by the occurrence of nystagmus when the eyes are rotated to the opposite side.

These considerations, and the known fact that supranuclear paralyses in other motor regions are spastic, lead the author to the conclusion that the paralyses of associated movements of the eyes are spastic paralyses. He advises ophthalmologists to employ the tests of Barany and Bielschowsky in investigating cases of defect of the motility of the eyes.

A. J. BALLANTYNE.

(2) Congenital family deafness, or hereditary degenerative deafness, is known to be often associated with eye affections of the type of retinitis pigmentosa, namely, retinitis pigmentosa itself, retinitis pigmentosa sine pigmento, atypical retinitis pigmentosa with retino-choroiditic patches, congenital hemeralopia, retinitis gyrata, and retinitis punctata albescens. Statistics show that three per cent. of deaf-mutes have retinitis pigmentosa, but if we exclude all but cases of congenital family deaf-mutism, and if we include the above conditions allied to retinitis pigmentosa, the relationship appears to be a much closer one. The pathological processes which occur in the eye and ear in such cases have certain points in common, namely, degeneration of sense epithelium, diminished vascularity of the parts, and concentric contraction of the field, auditory or visual.

A family has come under the notice of **van der Hoeve**, one member of which had retinitis punctata albescens, another retinitis punctata albescens combined with atypical retinitis pigmentosa, while a third presented a number of albinotic patches in the fundus. These three were deaf-mutes. Of the three remaining members, one had an albinotic fundus, the second was hemeralopic and had albinotic conditions in the fundus periphery, while the third had normal eyes and ears. Among the other relatives there were cases of dwarfism and idiocy. In the course of his discussion of the relationship between these affections of ear and eye, the author cites such phenomena as the partial albinism of deaf dancing mice and of deaf white cats, the pigment changes in cases of sympathetic ophthalmia complicated with deafness, and the pigmentary changes in the retina which von Stein claims to have produced by injuring the cochlea.

As regards the association of congenital family deafness and the retinal conditions referred to, the author does not think it has been proved that one depends upon the other. There is some support for the view that retinitis pigmentosa, deaf-mutism, etc., are manifestations of one and the same disease of the central nervous system. But the nature of this underlying cause is quite unknown.

A. J. BALLANTYNE.

III.—THE ANATOMY OF SUCCESSFUL GLAUCOMA OPERATIONS.

Holth.—Anatomical investigation of operation wounds and of decreased excavation of the papilla after successful glaucoma operations. (Anatomische Untersuchung der Operationsnarben und der aplanierten Papillen-exkavation nach erfolgreichen Glaukomoperationen.) *Bericht der Ophthalmologischen Gesellschaft*, Heidelberg, 1913, S. 355.

Holth, of Christiania, in addition to reading a paper upon the results of his operations for glaucoma at the Heidelberg Congress last August, gave an interesting demonstration of a series of microscopical sections he had obtained from patients upon whom he had operated.

Dr. Holth has kindly lent to THE OPHTHALMOSCOPE the original *clichés* from which the illustrations in the Heidelberg "Reports" were made, and, in consequence, the readers of this journal who have not access to the original, can study the nature of the fistulization which has been obtained.

Four eyes, taken from two patients, who died after the operation had been performed form the material of Holth's demonstration.

CASE I.

K. S., female, age 68. May 12th, 1908. During the last year patient has noticed that the right eye has been failing rapidly, and during the past eight days she has suffered from a tearing pain in the eye which radiated to the temple. No coloured rings have been seen round flames (?)

Present condition.—The corrected vision of the right eye is 5/15. The field of vision is contracted down to 3, 3, 7, 18, 40, 30 and 3, in the meridians 0°, 45°, 135°, 180°, 225°, 270° and 315° (Naples notation) There are striæ in the lens. The papilla is pale, and excavated to the edge. T.=48 mm. Hg., Schiötz.

The vision of the left eye is 5/10. The lens shows some opacities. The papilla is normal in colour and only slightly excavated. The cupping does not reach the edge. The field of vision is not contracted. T.=21 mm. Hg.

May 21st, 1908.—*Operation.* An iridencleisis with a meridional iridectomy was performed upon the right eye. Its nature is shown in the small inset to Fig. 1.

Nov. 17th, 1908.—V.R=5/12. The field of vision is larger. The papilla is flat. T.=15 mm. Hg. Good filtration round the wound.

May 2nd, 1912.—The acuity of the left eye has deteriorated during the last year. V.R=5/10. T.=10 mm. Hg. V.L=5/10. Field contracted. The papilla is excavated to the margin. T.=36 mm. Hg.

May 8th, 1912.—*Operation.* As the anterior chamber was rather shallow, an Elliot trephine operation was performed. The trephine used measured 2·5 mm. in diameter, but Holth prefers a diameter of 2 mm. (See Fig. 3). The iris prolapsed and a basal iridectomy was made. Care was taken not to replace the iris, in order to be certain that the walls of the aperture became covered with iris pigment.

After the operation, vision rose to 5/7·5 and the field of vision increased in size. The papilla became less excavated. The aperture remained patent, so much so that iris tissue could be seen at its base. The vision of the right eye rose to 5/15 and the optic disc remained flat. Good filtration was preserved, and a tripartite iris fistula was visible. R.T = 10 mm. Hg. L.T= 15·5 mm. Hg. November 10th, 1912.—Patient died of broncho-pneumonia.

Anatomical Examination.

The material was treated with formalin and alcohol, and the sections were stained by v. Gieson's method. The conditions found are sufficiently explained by the figures.

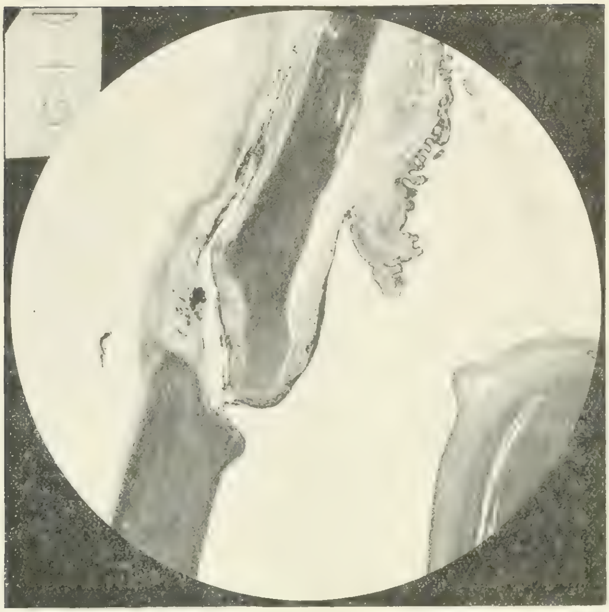


FIG. 1.—Case K.S. Right eye. Sagittal section through the centre of the scar (along the dotted line in the inset figure). This shows the condition found $4\frac{1}{2}$ years after a meridional iridectomy with iridencleisis. The iris has prevented union between the sides of the wound and a typical fistula has formed between the anterior chamber and the subconjunctival tissue. Magnification 18/1.

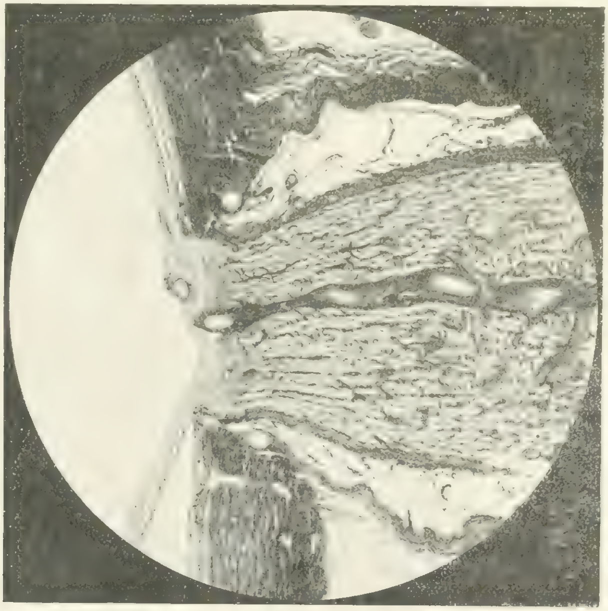


FIG. 2. CASE K.S. Right eye. Axial vertical section through the papilla. The lamina cribrosa is in its correct position. The central vessels are in the same plane as the retina. Before the operation the papilla was excavated to its margin. Magnification 18/1.

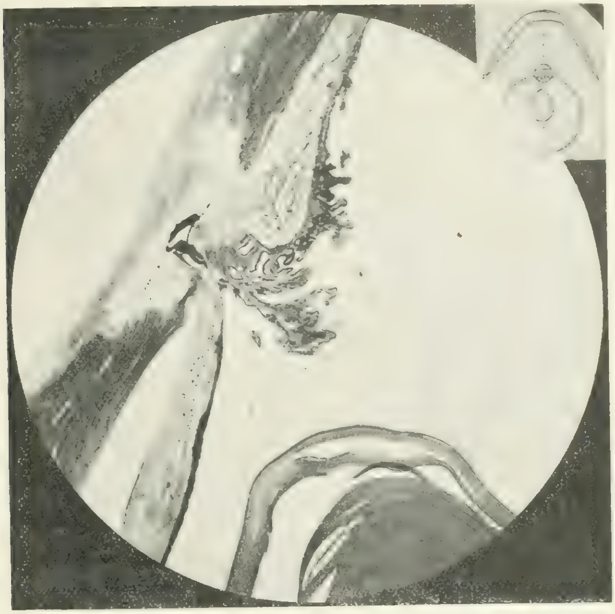


FIG. 3. CASE K.S. Left eye. Sagittal section through the centre of the scar (along the dotted line in the inset figure). The eye was examined six months after an Elliot's trephining with a 2.5 mm. instrument. The operation was combined with a peripheral iridectomy and iridencleisis. The iris fistula extends obliquely across the scar, and is therefore only partially evident in any single section. The trephine has completely traversed the sclera at the spot where the anterior portion of the ciliary body is exposed, but anteriorly the section was completed with de Wecker's scissors. Holth always tries to cut the corneal aspect first, but this is not always feasible because the sclera is thicker towards the cornea. Descemet's membrane is divided more peripherally than the sclera immediately above it, and so it curls up into the scleral defect.

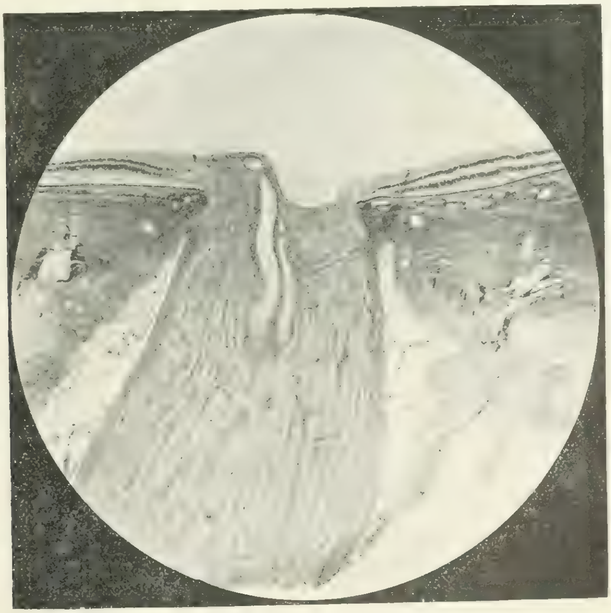


FIG. 4. Case K. S. Left eye. The section passes horizontally through the optic disc. The lamina cribrosa is in its normal position. The original central excavation is still present, but the glaucomatous cup, which developed subsequently, has disappeared. Magnification 14/1.

Case II.

M. G., age 79 years, female. November 12th, 1906, the left eye had been failing for a long time. During the past half year the acuity of the right has diminished. No obscurations of vision ; no rings round candles.

Present condition.—V. L. corrected = 5/60, the field is contracted down to 10°. The left disc is excavated to the extent of 4 dioptres, and the cupping extends to the edge.

V. R. corrected = 5/12, field contracted down to 25°. The papilla is pale and exhibits temporal excavation.

The tonometric reading is 30 mm. Hg. for each eye. Under treatment with pilocarpine the acuity of the left eye rose to 5/36, and that of the right to 5/6. Each field began to increase, and the tension fell to 20 mm. Hg. This condition remained unchanged during 1907 and 1908. But early in 1909, in spite of the use of miotics, deterioration was noted.

February 4th, 1909.—V.L. = hand movements. T = 43 mm. Hg. V.R. = 5/20. Nasal contraction of field down to 8° from the fixation point (nasal step). Bjerrum's scotoma typically present. T. = 36 mm. Hg. Some cataract noted. Disc deeply excavated.

Operations.

March 16th, on left eye. Limbal subconjunctival incision above with a keratome, followed by ordinary iridectomy, and then by the removal of a piece of sclera with the right-angled punch ; a piece of the anterior lip was excised, measuring 3 mm. by 2 mm. No encleisis of the iris was performed, nor did any iris prolapse.

March 19th.—A similar operation was performed upon the right eye, but the piece incised was only 1 mm. broad.

March 26th.—The cataract is increasing in the right eye.

April 10th.—Extraction of the cataract was carried out after a section which ended in clear cornea.

June 8th.—V.R. corrected = 5/8. The field has increased and Bjerrum's scotoma has disappeared. The excavation of the papilla is now confined to a small cup near the centre. T = 11·5 mm. Hg.

V.L. = fingers counted at ¾ metre. The field of vision is larger, the excavation of the disc has entirely disappeared. T = 15 mm. Hg. Each eye shows good filtration.

January 19th, 1910.—Discission of secondary cataract with a final acuity of 5/5.

April 30th, 1913.—Patient died of broncho-pneumonia.

Anatomical Examination.

The results of the anatomical examination are shown in the accompanying figures (Figs. 5 to 10).

Comments.

It will be seen that four different operations were performed, all of which resulted in the development of a fistula between the anterior chamber and the subconjunctival tissue.

In the right eye of the first case this result was attained by iris encleisis. Holth has noted a similar fistula in five or six other eyes which he had examined

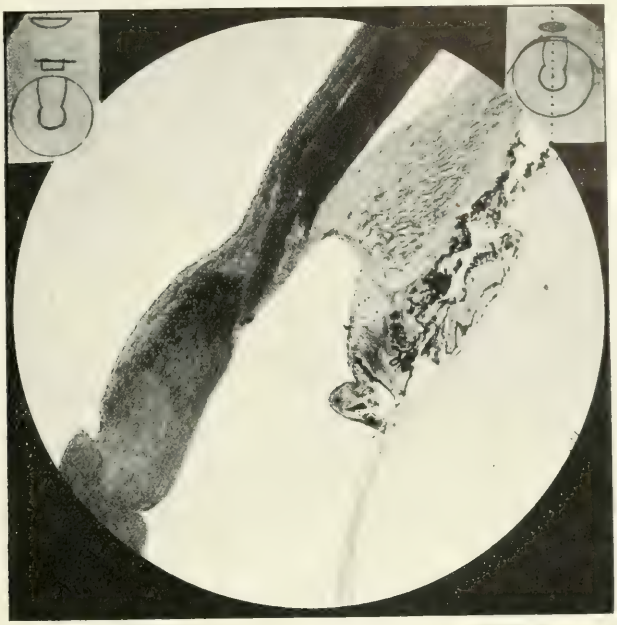


FIG. 5. Case M. G. Right eye. Sagittal section through the centre of the scar three years after a non-perforating 1 mm. broad sclerectomy with a punch. The scleral defect is filled with connective tissue which is partly derived from the sclera, partly from the subconjunctival tissue. Magnification 18/1.

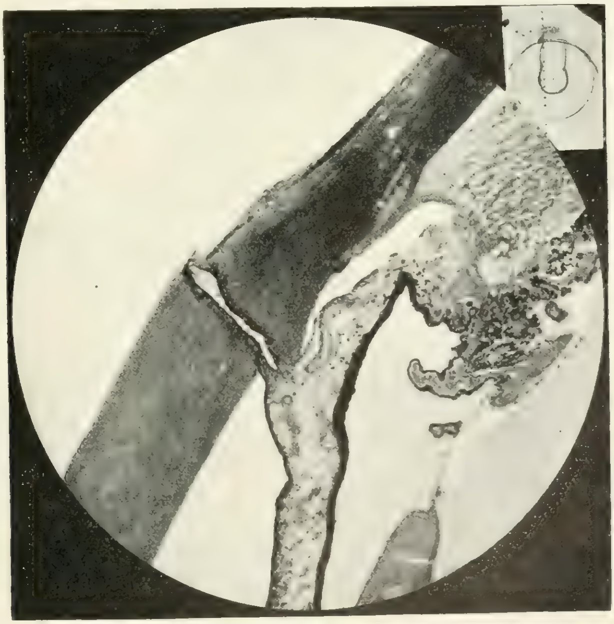


FIG. 6. Case M. G. Sagittal section through an iris fistula in the sclero-corneal cataract incision. Magnification 18/1.

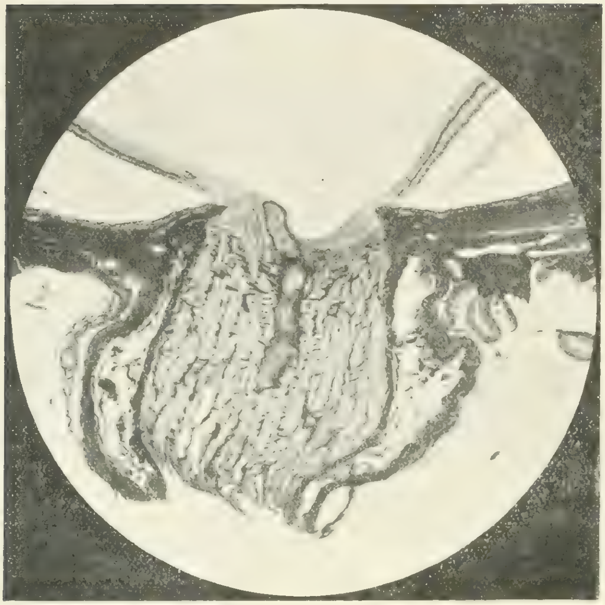


Fig. 7. Case M. G. Right eye. Horizontal section through the optic nerve. The central cup was noticed as early as 1906. Three years before death this nerve head was excavated in the centre. Magnification 14/1.

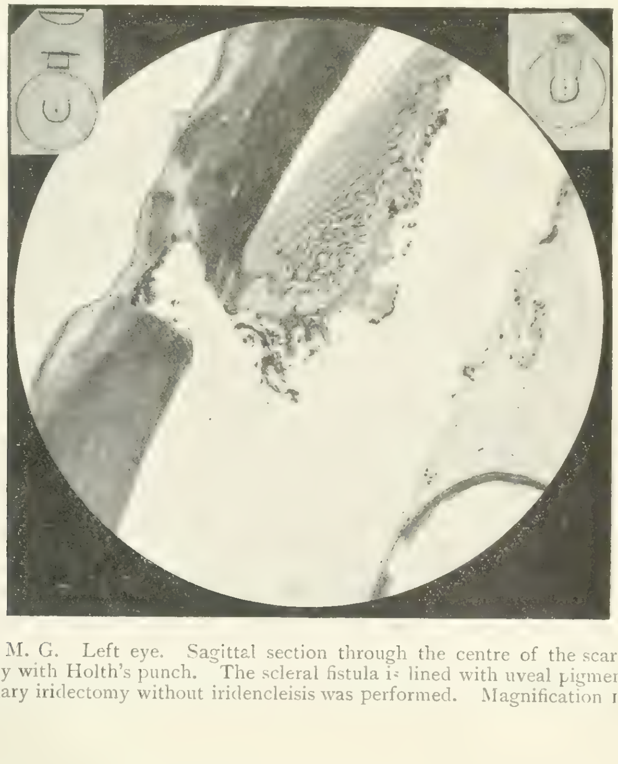


Fig. 8. Case M. G. Left eye. Sagittal section through the centre of the scar of a perforating limbal sclerectomy with Holth's punch. The scleral fistula is lined with uveal pigment in spite of the fact that an ordinary iridectomy without iridencleisis was performed. Magnification 18/1.

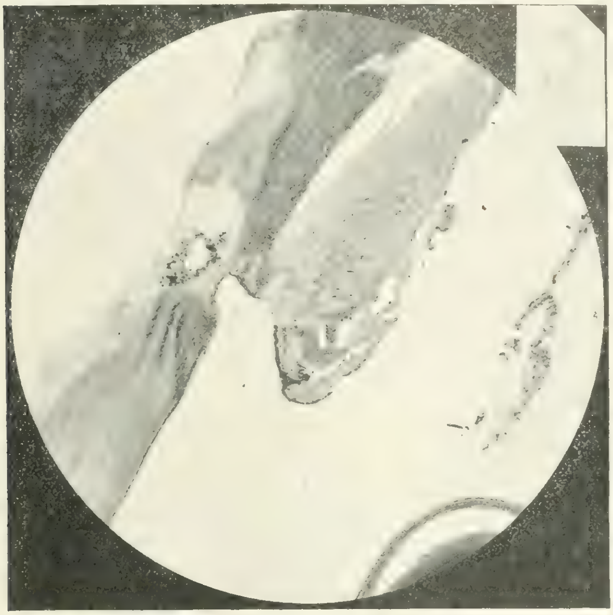


FIG. 9. Case M. G. Left eye. Sagittal section through the temporal end of the limbal sclerectomy scar. The scleral fistula is seen passing through a bridge of scleral scar tissue. Magnification 18/1.

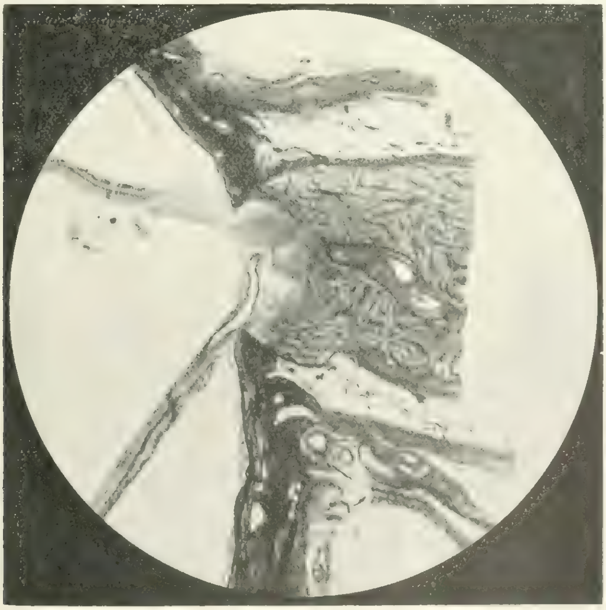


FIG. 10. Case M. G. This section shows the left nerve head. Before the operation the cup was 4D. deep. Magnification 14/1.

from a half to three years after the operation of iris encleisis. Eighty-five per cent. of these operations have resulted in such fistulæ. Fifteen per cent. were failures ; no fistulæ formed and the tension was not lowered.

Since June, 1908, Holth has followed out Lagrange's principle, making a limbal sclerectomy with his punch. Since January, 1910, he has also employed Elliot's operation. Both methods have often given filtering scars, with permanent reduction of tension. But occasionally it occurs, that the opening firmly heals up, even after technically perfect operations with trephine or punch. In these cases there can be no question of filtration ; the operation is a failure. This is exceptional. Both the punch operation and Elliot's operation, as a rule, result in filtering scars. Holth originally thought that the reason that the scleral defect so frequently remains more or less open was that the aqueous, passing through the aperture, hinders healing, just as Thomson Henderson has shown that iridectomy wounds never cicatrise, because they lie in the aqueous. Recent research has now convinced him that the explanation is that the walls of the wound became lined with uveal pigment. In all cases an iridectomy should be added to the sclerectomy, in order to allow pigment cells to wander out towards the sclerectomy. If no iridectomy be made, the aperture may become blocked with iris tissue, and then no pigment cells can reach it. If the operation be a failure, Holth repeats it below, adding an iris encleisis. If the sclerectomy be performed according to Elliot's *technique*, the iris seldom remains in the wound, but retreats into the anterior chamber. But if the punch operation be performed, following an oblique incision with a keratome, it is easy to leave a tag of iris in the aperture, with the result that an iris fistula remains.

The punch operation has another advantage over Elliot's. The anterior portion of the ciliary body is never exposed. It is very hard to avoid exposing it in operation if a 2 mm. to 2·5 mm. trephine be used. It is true that "splitting" up the cornea tends to render this error less frequent, but one can never be certain that the ciliary body will be avoided. In spite of every precaution, Holth has seen Elliot's "quiet" iritis, which he thinks can more easily be avoided after the punch operation. It is true that the ciliary body is not exposed if a 1 mm. to 1·5 mm. trephine be chosen, but in this case the iridectomy is difficult, and such a small hole frequently heals up firmly.

Holth draws attention to the disappearance of the papillary excavation in his four cases. He has often noted it after successful iridencleisis operations, and he agrees with Axenfeld that it is a not infrequent result of operations for glaucoma. It occurs only when the tension is permanently lowered to normal, or has become subnormal. But, in spite of lowered tension, the cup may persist, and even when it disappears, the disc may remain pale, and loss of vision may be progressive. In other cases the disc may quite recover its normal appearance, and the acuity of vision may remain unaltered for years.

T. HARRISON BUTLER.

IV.—THE ÆTIOLOGY OF INTERSTITIAL KERATITIS.

Stargardt, K.—Upon the ætiology of interstitial keratitis. (Zur Aetiologie der parenchymatösen Keratitis.) *Bericht der Ophthalmologischen Gesellschaft*, Heidelberg, 1913, S. 316.

Stargardt, of Hamburg, gave an account of some very valuable experiments he had conducted to determine the nature of interstitial keratitis.

The ætiology of interstitial keratitis which is common in cases of inherited syphilis, and which is occasionally seen in the acquired disease, is even now not fully explained. There are two views: one is that the inflammation is excited by toxines produced by the syphilitic infection in other parts of the body. The second, and more modern, view is that the disease is due to the actual presence of the *Spirochæta pallida* in the cornea. This last view is supported by the facts that the organism has been found in the cornea of new-born syphilitic babies, that the disease can be experimentaly induced in animals by the injection of spirochætæ, and that in the trypanosome diseases, which are closely related to syphilis, an interstitial keratitis occurs which is in all respects like the syphilitic type of keratitis, and that here trypanosomes can be demonstrated in the tissues of the cornea.

In spite of these facts, many authors adhere to the older theory, and Clausen has recently published a research in the *Archives of Ophthalmology* which led him to conclude that interstitial keratitis is not caused by the spirochætæ themselves, but is due to "a general deterioration of the nutrition of the cornea." Two considerations seem to have led Clausen to this opinion: (1) A. Leber has stated that toxines alone are capable of causing the keratitis in animals infected with trypanosomes, and (2) spirochætæ have so far not been definitely demonstrated in the corneæ of human individuals suffering from interstitial keratitis.

Stargardt felt these objections to be so weighty that he determined to investigate the question for himself. He carried out his research in the Hamburg Institution for Marine and Tropical Diseases. Working with dogs, rabbits, guinea pigs, and rats with various strains of ngana and dourine trypanosomes he arrived at conclusions which were essentially different from Leber's.

He injected blood which was swarming with trypanosomes under the conjunctivæ of rabbits and guinea pigs, close to the cornea, and in many cases produced an interstitial keratitis which started from the site of the injection. In other experiments no keratitis was noted. The presence or absence of the corneal inflammation depended partly upon the strain of organism used and partly upon unknown factors.

In every case in which an interstitial keratitis was present Stargardt found trypanosomes, often in large numbers, in the cornea. Similar results were seen when blood containing the parasites was injected into the aqueous or the vitreous.

The same phenomena followed the injection of pure trypanosomes freed from blood.

He always found the organism in the cornea of dogs suffering from ngana and dourine which developed interstitial keratitis spontaneously.

The author then repeated the experiments, injecting the fluid containing the toxines of trypanosomes, and dead trypanosomes. In neither case did he succeed in inducing any inflammation of the cornea. The details of the methods employed are fully set forth in the paper. The conclusion is that to produce interstitial keratitis it is necessary for living trypanosomes to gain access to the corneal tissues.

Stargardt thinks that the analogy between syphilis and trypanosomiasis is so great that it is justifiable to say that what is true of one disease is equally so of the other, and he holds that his experiments strongly support the view that interstitial keratitis in the victims of congenital syphilis is caused by the presence of living spirochætæ in the tissues of the cornea. This view is, again, strengthened by the fact that Noguchi has now shown that general paralysis is caused by the actual presence of spirochætæ in the brain. It is also supported by the discovery by Wolbach and Binger, that in sleeping sickness trypanosomes can be detected in the brain. Finally, Igersheimer has detected spirochætæ in the cornea in cases of interstitial keratitis, and Clausen never failed to produce the disease in rabbits by inoculating the aqueous of a rabbit affected with syphilitic interstitial keratitis. T. HARRISON BUTLER.

V.—DISEASES OF THE ORBIT.

(1) Cargill, L. Vernon.—Double proptosis due to a growth, lymphoma (hæmangio-lymphadenoma), invading each orbit. *Proceedings Royal Society of Medicine*, January, 1911.

(2) Weidler, Walter B. — Small round-cell sarcoma of the orbital cellular tissue. *Ophthalmic Record*, January, 1911.

(3) Hosford, J. Stroud.—A lecture on some points in the diagnosis of orbital disease. *Lancet*, 21st January, 1911.

(4) Birch-Hirschfeld and Meltzler.—A contribution to the study of traumatic enophthalmus. *Archives of Ophthalmology*, March, 1911.

(5) Klinedinst, J. F.—A case of varix or angioma venosum of the orbit. *Ophthalmology*, April, 1911.

(6) Birch-Hirschfeld, A.—A contribution to the chapter of orbital inflammations, and especially of their treatment. (Zum Kapital der Orbitalentzündungen besonders ihrer Therapie.) *Zeitschrift für Augenheilkunde*, Januar, 1912.

(7) Post, M. H.—Exophthalmos from a bony tumour growing from the nasal wall of the left orbit. *American Journal of Ophthalmology*, February, 1912.

(8) Alt, Adolf.—Microscopical examination of Dr. Post's tumour removed from the orbit. *American Journal of Ophthalmology*, February, 1912.

(9) Birch-Hirschfeld. A. and Romeick, Fr.—Intermittent exophthalmos. (Ueber intermittierenden Exophthalmus.) *Klin. Monatsbl. f. Augenheilk.*, April, 1912.

(10) Fage.—Paralyses of the muscles of the eye in traumatisms of the orbital margin. (Paralysies des muscles de l'œil dans les traumatismes du rebord orbitaire.) *Archives d'Ophtalmologie*, mai, 1912.

(11) Sulzer and Chappé.—Tumour of the orbit and deep membranes "Posterior baphthalmus." (Tumeur de l'orbite et des membranes profondes "Baphthalmie postérieure.") *Ann. d'Oculistique*, mai, 1912.

(12) Holdsworth, F.—Orbital cellulitis with report of a case. *Ophthalmic Record*, June, 1912.

(13) Allport, Frank.—Removal of a spindle-cell sarcoma from the right orbit. Recovery with intact ocular apparatus. *Ophthalmic Record*, July, 1912.

(14) Cosmettatos, G. F.—Two cases of echinococcus in the orbit. (Zwei Fälle von Echinokokken der Orbita.) *Klin. Monatsbl. f. Augenheilkunde*, September, 1912.

(15) **Pooley, G. H.—Hydatid cyst of orbit.** *Ophth. Rev.*, September, 1912.

(16) **Collins, Sir William.—Tumours of the orbit: a plea for operation.** *British Medical Journal*, February 22nd, 1913.

(17) **Cotterill, J. M., and Mackay, George.—Hæmatoma of the left orbit treated by modified Krönlein's operation.** *British Medical Journal*, 22nd February, 1913,

(18) **Rübel, Eugen.—Enophthalmos on drawing apart the lids. (Enophthalmus beim Auseinanderziehen der Lider.** *Klin. Monatsbl. f. Augenheilk.*, Februar, 1913.

(19) **Takashima, S.—A case of orbital thrombo-phlebitis after extirpation of the lacrymal sac, with reference to the pathological-anatomical findings. (Ein Fall von Thrombophlebitis orbitalis nach Tränensack-extirpation unter Berücksichtigung des pathologisch-anatomischen Befundes.)** *Klin. Monastbl. f. Augenheilk.*, März, 1913.

(20) **Chevallereau, A. and Offret.—Exophthalmos consecutive to an inflammation of the extrinsic eye muscles. (Exophtalmie consécutive à une inflammation des muscles extrinsèques de l'œil.)** *Ann. d'Oculistique*, juillet, 1913.

(2) **Weidler,** of New York, describes a case of small round-cell sarcoma of the orbit in a coloured male patient, 69 years of age. The growth appeared about a year after a blow on the brow and eyelid by a piece of wood, but the writer does not ascribe any part to the injury in the ætiology of the disease. Clinically, the growth was smooth and somewhat solid in consistence and was situated above the right eyeball and pushed the upper lid forwards, and the eye downwards, inwards, and markedly forward. Good movement of the eye was retained. R.V. 5/60. The eye and tumour could not be removed through the palpebral aperture, but they were easily removed, along with the whole orbital contents, through a curvilinear incision 6 mm. below the orbital ridge. There was no sign of recurrence of the growth during the three years the patient was kept under observation. The author remarks on the difficulty in diagnosing round-cell sarcoma from gummatous and leukæmic tumours, and the conflict of opinion as to the desirability of surgical treatment in sarcoma of the orbit. J. JAMESON EVANS.

(3) This long and interesting lecture by **Hosford**, of London, is so crammed with personal experience and detail, and is at the same time, unfortunately, so discursively composed and loosely written, that to make a readable abstract is almost impossible. We refer readers to the original, in which they will find much information likely to be of service when in difficulties over the diagnosis of orbital disease. S. E.

(4) Four fresh cases of enophthalmus are here reported and the causation discussed. In each case there was a fracture of the orbital wall. In two cases this injury was deduced from the symptoms and in the other two proved by the findings of the X-rays. The authors have studied seventy cases altogether, including these four, in the literature and conclude that, although these fresh cases support Lederer's view that in most cases fracture of the orbit plays the principal *rôle*, yet this does not account for all cases. More careful observation, the authors think, will probably show that the clinical picture under discussion may be produced by various agencies, and not seldom, perhaps, by the combination of a number of mechanical or nervous factors. ROSA FORD.

(5) The case reported by **Klinedinst**, of York, Pa., was a man, aged 31, complaining of swelling of the right lower eyelid, which appeared whenever

he stooped forward, as, for instance, in tying his shoe, and disappeared again on rising. The symptoms were of five years' duration, and there was no known cause. Examination showed a soft compressible swelling of the outer half of the right lower lid, with obliteration of the conjunctival cul-de-sac in the same situation by a bluish swelling, like an enlarged vein, a quarter of an inch in diameter. There was no bruit or pulsation, no interference with vision, and the fundus was normal. No good resulted from a number of applications of electrolysis, both with the anode and with the kathode. Then, with a view to setting up an obliterative periphlebitis, four injections of alcohol were made at intervals of one week. From three to six drops were injected along the floor of the orbit beneath the tumour. Each injection was followed immediately by severe pain of short duration, there was some local reaction, and soreness persisted for some days. After the third injection, the tumour had disappeared, and the author reports, a year later, that there has been no recurrence. The literature of the subject is briefly discussed.

A. J. BALLANTYNE.

(6) **Birch-Hirschfeld**, of Leipzig, gives an account of fifteen interesting cases of orbital inflammation, and offers suggestions regarding their treatment.

The first case was one of tuberculosis which was at first diagnosed as a new growth, a diagnosis which seemed to be confirmed by the miscroscopical examination of material removed by a Krönlein operation. When, however, the whole orbit was exenterated, the true nature of the disease was determined by the discovery of bacilli. The second case was of gummatous growth in the orbit, the only indication of syphilis being a positive Wassermann reaction. Appropriate mercurial treatment resulted in cure. The third case was a mucocele of the frontal sinus and the ethmoid cells. The fourth case showed how necessary it is, when there has been any accident, to keep in mind the possibility of a foreign body in the orbit. Two splinters of wood, each 20 mm. long and 3 mm. broad, were discovered. The other cases were associated with sinus disease.

The author discusses the relative positions of the oculist and rhinologist in these cases, and considers that the latter should undertake any measures involving radical operation upon the sinuses. He does not approve of simple puncture with a thin knife and drainage in cases of orbital abscess. The correct procedure is to expose the orbital margin freely, and separate the periosteum with a blunt instrument. By this means a subperiosteal abscess may be evacuated without any serious implication of the orbit.

T. HARRISON BUTLER.

(7 and 8) This very unusual case by **Post**, of St. Louis, is that of a woman, of nineteen years, who first noticed diplopia two years before coming under observation. Post, having diagnosed a tumour to the nasal side of the globe, and well back in the orbit, pressing on the third nerve, sent the case for Wassermann reaction. Result negative. The patient was then sent for nasal examination. The report *re* sinus disease was negative. Then she was radiographed, and it was reported that there was a bone tumour well back in the orbit. Mercury and iodide were tried, without result. After a consultation with Dr. Mudd, the iodide was pushed, again without result. Dr. Mudd then removed the eye, the contents of the orbit, the periosteum of the orbit, and, after that, the tumour. The tumour was located about half an inch back in the orbit, and extended almost to the sphenoidal fissure. It seemed to originate in the ethmoid cells, and it carried before it part of the lacrimal bone and the lamina papyracea of the ethmoid.

The specimen was examined by **Alt**, of St. Louis. The report seems of sufficient interest to warrant a rather full transcription :

The specimen "consisted of a somewhat curved thin bony plate with rounded edges 27 mm. long, and at its greatest width 13 mm. wide, which represented the lamina papyracea of the ethmoid bone. On the nasal side and about at its middle a roundish, partly bony mass was attached, which was of the size of a small hazel nut. Its appearance was somewhat brownish. On section, it was, even macroscopically, seen to consist of a number of cells varying in size and partly filled with a chocolate-brown coagulated mass. No solid part was visible.

Under the microscope, the bony walls of the numerous cells showed nothing abnormal. Nowhere, in the numerous sections, could any sign of corrosion or of proliferation be found. In some sections the small quantity of marrow contained in the thicker parts of the bone was highly infiltrated and in those at the ethmoidal side numerous nests of psammoma bodies were found.

The mucous membrane lining the cells I found in a high state of inflammation. In places it is enormously thickened by hyperæmia and cell infiltration and forms microscopical polypi springing forth into the lumen of the cell; in some parts it is detached from the underlying bone, but this may be an artifact. A large number of mucous glands show a considerable distention of their lumen. The epithelium is well preserved in all the sections.

The specimen, therefore, does not show the presence of any malignant tumour, and, more strangely yet, no sign of proliferation or bony growth. The psammoma bodies might, perhaps, point to the presence of an epitheliomatous growth in a part which was not included in the specimen. However, there is no sign of such a growth in all the sections I have examined. The only visible pathological condition is the severe inflammation of the mucous membrane lining the cells of the specimen. The contents of these cells, where they have not fallen out, are coagulated mucus or blood and mucus."

Alt then goes on to say that the only similar condition which he has found in the literature differs in essential points from the one under discussion, namely, hydrops of the ethmoid labyrinth as described by Hajek (*Pathologie und Therapie der entzündlichen Erkrankungen der Nebenhöhlen der Nase*, page 214).

Finally, he says, "The only pathologic condition the microscopic examination revealed was a high degree of inflammation of the mucous membrane with, perhaps, a retention of mucous, and hæmorrhages in the cell cavities."

ERNEST THOMSON.

(9) The case reported by **Birch-Hirschfeld** and **Romeick,** of Leipzig, was as follows.—A woman, aged 41, suffered, at the age of 19, from a nervous shock with loss of consciousness and deviation of the mouth to the right side. For the last ten years she has had, at monthly intervals, a variety of epileptiform attack, before and during which there was protrusion of the eyes, especially of the left. She has recently found that she can cause prominence of the eyes at any time by bending the head forward, backward, or to the left side, or by constriction of the neck. These phenomena were confirmed as regards the left eye by examination, and it was noticed that there was a varix situated in front of the left external orbital margin. Pressure on this also produced exophthalmos. The diagnosis was "Intermittent exophthalmos due to varix of the orbit communicating with varix at the external orbital margin."

The mechanism and ætiology of the condition are a little obscure. The authors have proved to their satisfaction that the most important factor in producing the protrusion is obstruction to the venous outflow from the orbit, and that the anterior channels are especially involved. They assume that there is a narrowing (possibly congenital) of the facial and jugular veins. It is suggested that the recurrence of the symptoms in association with menstruation may be caused by swelling of the thyroid at the period, and the epileptiform attacks are attributed to a somewhat similar stasis of the cerebral veins. The changes of position of the eyes under different conditions were investigated and measured by photographic methods. These details, as well as particulars of cases recorded since the publication of the Graefe-Sæmisch *Handbuch*, should be sought in the original. A. J. BALLANTYNE.

(10) **Fage**, of Amiens, reports three cases of paralysis of an ocular muscle following a blow on the orbital margin. One recovered completely; the other two partially. Among the explanations as to causation already advanced he considers that hæmorrhage into the sheath of the muscle with rupture of muscle fibres or a fissure fracture in the floor or vault of the orbit are the two most likely. A crack in the floor would be responsible for the paralysis of an inferior oblique or rectus, and in the vault for the paralysis of a superior rectus or levator palpebræ superioris, in both cases by causing inflammation and subsequent degeneration of the nerve supplying the muscle in question. The prognosis should be guarded.* BERNARD CRIDLAND.

(11) **Sulzer** and **Chappé**, of Paris, record a case which they believe to be unique.—The patient, a girl aged five years, of good personal and family history, was seen on 27th February, 1912, when the mother stated that a defect in her right eye had been noticed for the first time six months previously. On examination, the right eye was found to be proptosed about 1 cm., and displaced downwards and outwards. Its mobility was limited in all directions, and rotation upwards was almost or completely abolished. Its cornea and iris were of normal diameter, but its equatorial diameter was increased, measuring 26 mm. as compared with 20 mm. in the other eye. The intra-ocular tension was normal. The eye was completely blind, and the pupil was inactive to direct, but active to consensual stimulation with light. Ophthalmoscopically, there was an almost spherical cyst, two disc-diameters in size, the same colour as a normal optic disc, situated at the temporal margin of the disc, and covering its outer four-fifths. The uncovered part of the disc was normal. There was no inflammatory reaction around the cyst, the walls of which were perfectly clear and slightly vascular, while some retinal vessels crossed it. There was nothing in the general condition of the patient to throw any light on the nature of the ocular lesion, and no further information was gained from palpation of the orbit or radiography. The age of the patient contradicted the diagnosis of leukaemia, and the absence of pain and inflammatory reaction that of osteo-sarcoma, while the appearance of the tumour differed from that of a glioma. The possibility that the orbital and intra-ocular growths were independent is suggested. The authors seem to lean to the conclusion that the tumour was gliomatous, but fail to offer any explanation of the posterior bapthalmus. R. J. COULTER.

(12) **Holdsworth,** of Travasse City, Mich., reports a case of right orbital cellulitis, with marked proptosis and chemosis, associated with signs of ethmoiditis on the same side. No pus was found in the orbit by curved orbitotomy, but two days later, it began to drain through the wound and the symptoms gradually subsided. J. JAMESON EVANS.

(13) **Allport**, of Chicago, records the successful removal of three encapsuled growths, of the size of pecan nuts, from the orbit of a woman aged 24, whose vision, fundus, fields, and ocular movements were practically normal, but who showed a slight proptosis of the eye. The incision used was similar to a Killian's frontal sinus incision. Nine months after operation, there was no sign

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* See abstracts on p. 369 of the present issue.

of recurrence, all deformity had disappeared, and the ocular functions were normal. The growths were sarcomata of the spindle-cell variety.

J. JAMESON EVANS.

(14) **Cosmettatos,** of Athens, has had the opportunity of observing two cases of echinococcus cyst of the orbit.

The first patient was a female, 30 years of age. She gave a history that for four years she had, at intervals of three to six months, suffered from severe orbital pain and protrusion of the eyeball. For five months before observation the symptoms had persisted, and had become unbearable. The exophthalmos was extreme, and there was a septic infection of the cornea from exposure. Swelling was felt in the upper-inner part of the orbit. The cyst burst in attempting its removal. As the septic condition of the eye progressed, enucleation was performed, and it was found that the cyst had embraced the whole eyeball.

The second example was in a man of 55. There was a history of pain and exophthalmos extending over six years. The cyst had been tapped or had ruptured on several occasions with temporary relief. At the operation it was found that the cyst occupied the whole of the upper part of the orbit. It was evacuated and partly removed, and for some time the cavity was packed and cleansed daily. The eye was saved.

On the basis of these and of other recorded cases, the author gives a summary of the important features of this rare condition.

A. J. BALLANTYNE.

(15) This report, by **Pooley,** of Sheffield, deals with the case of a boy, aged seven years, who had had a portion of "a lympathic cyst of the nerve" removed from the left orbit by a modified Krönlein. In September, 1909, on account of increasing proptosis with œdema of the lids, impaired ocular movements and pallor of the optic disc, Pooley opened the orbit and found a fibrous mass occupying the greater part of the retro-ocular portion of the orbit and partially enveloping the optic nerve. The mass contained a hydatid cyst with scolices in it, but no daughter cysts. On recovery, the ocular movements were good. Owing to recurrence of the proptosis, the orbit was again opened in January, 1911, and two cysts were found in the roof, which had hollowed out the bone without perforating it; these were successfully removed, after section of the optic nerve. There has been no further recurrence.

A. H. PAYAN DAWNAY.

(16) The orbit, says **Sir William Collins**, of London, is territory upon which the ophthalmologist and the general surgeon meet. The pathology and classification of orbital growths of vascular and of malignant nature are not thoroughly elucidated and their treatment often not too satisfactory. In the experience of the author, operation is more hopeful than some writers imply. Collins relates five cases in which he operated successfully. In three cases the orbit was cleared out for sarcoma; in one case of venous cavernous angioma the right common carotid was tied without result, and afterwards the eye was excised, the mass separated from the bony walls of the orbit, and the vessels clamped and tied far back. In the fifth case, a very desperate operation involving the removal of most of one superior maxilla, gave the patient a year more of life.

ERNEST THOMSON.

(17) **Cotterill and Mackay**, of Edinburgh, report the following case.—A blacksmith was struck on the left temple with a horse's head when shoeing the animal. There was no external bruise and the sight was unaffected. Some months later, when the patient stooped at his work, the left eye tended to come forward, and returned to normal position when the head was raised. The condition became more marked, and, apparently about a year after the

accident, he first saw Mackay. There were ptosis, protrusion, and marked fixation of the eyeball, but no definite tumour or nodulation could be felt in the orbit. No pulsation or thrill was detected nor was any bruit felt over the eye or temporal region. Vision almost full and nothing in the fundus. Examination of nose, pharynx, and sinuses with negative result. The orbit was opened by the bony route by Cotterill. Just inside the periosteum at the back of the orbital cavity a mass was felt which proved to be a hæmatoma. About a tablespoonful of recent clot was removed, and as nothing more could be felt, the wound was closed. Disappearance of all the symptoms except for slight diplopia on looking to the extreme left. ERNEST THOMSON.

(18) The case reported by **Rübel**, of Freiburg, was that of a much emaciated man of 44 years, with sunken eyes and a deep sulcus below the superior border of the orbit. On drawing apart the lids, the eye retreated three or four millimetres into the orbit, and active movements of the eye were for the time greatly limited. Relaxation of the lids allowed the eye to resume its original position. Drawing down the lower lid caused an upward rotation of the eyeball.

One previous case has been reported by Axenfeld and Förster, and the same explanation is offered for the present example. In consequence of great reduction of the orbital fat, atmospheric pressure and the pull of the muscles cause the eye to sink back in the orbit, while the muscles fall into closer relation to the optic nerve. The fasciæ which pass between the muscles and the lids are drawn upon, and thus the deepening of the sulcus above the globe is produced. When the lids are pulled upon, the tension on the fascial connections widens the muscular funnel, and under the pressure of the air, the eye is forced backwards. A. J. BALLANTYNE.

(19) **Takashima**, of Saga, Japan, reports a patient in whom there developed an abscess of the eyelid and signs of orbital phlegmon, twenty-four hours after excision of the lacrymal sac, with death from pyæmia four days later.

Microscopic examination of the orbital contents showed inflammation, infiltration, and abscess formation in the orbital contents and Tenon's capsule, and also inflammatory changes in the cornea and retina, which represented an early stage of panophthalmitis. He believes that inflammation extended from the sac through the capillaries surrounding it to the frontal and orbital veins, and that the orbital inflammation extended to the interior of the eyeball by continuity along the walls of the vortex veins.

This extension from the orbit to the interior of the eye is unusual.

A. J. BALLANTYNE.

(20) **Chevallereau and Offret**, of Paris, record the case of a patient, aged 54 years, who suffered from exophthalmos of the left eye, commencing in August, 1911. As this was was slowly increasing and caused strabismus upwards and outwards, with troublesome diplopia, a Krönlein's operation was performed, and two fairly large masses were removed, one from the region of the rectus internus and the other from the floor of the orbit in the locality of the rectus inferior. Microscopic examination showed that these consisted of degenerating muscular tissue with infiltration of leucocytes and sclerosis of the interstitial tissue. *Diagnosis*, Myositis.

The wound healed well, but there was no diminution in the exophthalmos, which, on the contrary, continued to increase. As the eye became very painful and the cornea ulcerated, exenteration of the orbit was performed on January 10th, 1913, with relief of the symptoms. All the usual medical treatments were tried, but the patient could not stand iodides and would not be persuaded to push mercury. The Wassermann reaction was negative in September, 1911, but positive in May, 1913.

Pathological examination showed that the extrinsic eye muscles were much enlarged, the surface of the section of the inferior rectus measuring 92·5 mm, instead of 15·9 mm., as normally. This enlargement was due to cellular infiltration and fibrosis. The infiltration was both diffuse and nodular. The nodules were irregularly distributed in the aponeurosis, the peri- and intra-fascicular spaces, and constantly present around the central vessels. They were of irregular shape and consisted of elements grouped as in a typical follicular formation. The sclerosis consisted of increased adult fibrous tissue in the sheath and between and within the muscular bundles. Its activity was shown by the presence among its fibres of oval nuclei in the midst of amorphous hyaloplasm. The vascular regions were confined to the small vessels, and consisted in proliferation of the endothelial cells with frequent diapedeses. The muscular fibres were partly healthy, partly inflamed, and partly destroyed and replaced by fibrous tissue. Examination for tubercle bacilli, spirochæta pallida, and sporotrichum Beurmanni gave negative results.

The diagnosis was nodular myositis, and from the absence of all evidence of tubercle or sporotrichosis, together with the positive Wassermann, and certain clinical signs (pupillary inequality, lichen urticans, etc.,) the authors consider that the most probable cause of the condition was syphilis.

R. J. COULTER.

VI—AFFECTIONS OF THE HYPOPHYSIS.

(1) **Lange, O.—Diseases of the pituitary body and its neighbourhood, and the question of binasal hemianopsia. (Zur Kasuistik der Erkrankungen der Hypophysis und deren Umgebung, sowie zur Kenntnis der binasalen Hemianopsie.)** *Klin. Monatsbl. f. Augenheilkunde*, Juli, 1913.

(2) **Boer, W.—Disease of the hypophysis and eye symptoms, with report of three cases. (Hypophysiserkrankungen und Augensymptome mit Bericht über drei beobachtete Fälle.)** *Klin. Monatsbl. f. Augenheilkunde*, Oktober-November, 1913.

(1) In the first part of this paper **Lange**, of Brunswick, relates two cases in which a diagnosis of disease of the pituitary body was made. Both presented certain general symptoms combined with bitemporal hemianopsia. Frequent and pronounced variations occurred in the condition of central vision and of the fields, and the author draws attention to the cheerful mental attitude of both patients, maintained in spite of the great visual disturbance and other distressing symptoms. There was no *post-mortem* confirmation of the diagnosis in either case.

Lange also reports a third case presenting atrophy of both optic nerves, paralytic divergence of one eye, totally inactive pupils, loss of perception of red and green, vision reduced to fingers, and *binasal* hemianopsia. After discussing the possible explanations for such a combination of symptoms, he expresses his agreement with the view of Bernheimer, that the uncrossed fibres of the visual path occupy the dorsal aspect of the chiasma, and his belief that a binasal hemianopsia might be caused by a hæmorrhage in that situation.

A. J. BALLANTYNE.

(2) Of the three cases of pituitary disease reported by **Boer**, of Halle, two belonged to Fröhlich's "dystrophia adiposo-genitalis" type. In the first of these the arrest of normal bodily development began at the age of fourteen, but

failure of vision was not noted till the twenty-second year. The fundi showed pale discs, narrow arteries, and old peripheral choroiditis. There was homonymous hemianopia, and vision was 5/5 in one eye and 3/50 in the other. After tapping the lateral ventricles, vision fell to 5/50 and 2/50, the remaining halves of the fields contracted considerably, and the discs became pale and swollen. In the course of some months these changes passed off, and the state of the patient returned to that first recorded. The second patient began to suffer from visual failure and adiposity at the age of five. The eye symptoms were great reduction of vision (fingers), photophobia, defective light-reaction of the pupils, central posterior polar cataract, absence of pigment from fundus, pale and blurry discs, narrow vessels, and nystagmus. The third case, a boy of ten years, showed precocious development of sexual characteristics, failure of vision of six months' duration, enlargement and deficient reaction of left pupil, slight vertical nystagmus, pallor of discs, narrowness of retinal vessels, and enlargement of the thyroid.

The author points out that the most important symptom of pituitary tumour is hemianopia, which, according to Uhthoff, is present in 54.3 per cent. of pituitary cases with acromegaly and in 31.8 per cent. of cases without acromegaly. Choked disc is relatively seldom seen in cases of pituitary tumour. In some cases it seems to be attributable to internal hydrocephalus, which may have been the cause of the neuritis in Boer's first case; for at the operation there was found to be distension of the lateral ventricles under pressure. The X-rays have played an important and useful part in the diagnosis of these tumours, and it is even possible in some cases to ascertain which part of the gland is involved by the changes in the form and size of the sella Turcica and dorsum sellæ.

With regard to treatment, the best operative results have been obtained in cases of pituitary tumour with acromegaly. Operation has not been so successful in cases of dystrophia adiposo-genitalis. The paper discusses the attempts which have been made to deal with these conditions by different procedures: trephining of the cranium, decompression through the floor of the third ventricle, cerebral puncture, and puncture through the corpus callosum. A. J. BALLANTYNE.

VII.—THE EYE SYMPTOMS OF GENERAL PARALYSIS.

Uhthoff, W.—Facts concerning the eye symptoms in general paralysis. (Einiges über Augensymptome bei der progressiven Paralyse.) *Bericht der Ophthalmologischen Gesellschaft,* Heidelberg, 1913, S. 80.

W. Uhthoff, of Breslau, read a valuable paper before the Heidelberg Congress which summarised the results of his vast experience of the eye symptoms present in general paralysis of the insane.

After a short account of the views held by various authorities in the past, some of whom either from faulty ophthalmoscopic *technique* or from ill-regulated enthusiasm had fallen into rather fanciful errors, he gave a table which shows the percentage incidence of the various ocular complications, part of which we reproduce :—

Optic atrophy, 8 per cent.
Optic neuritis, 2 per cent.
Argyll Robertson pupil, 44 per cent.
Sluggish reaction of the pupils to light, 16 per cent.

Anisocoria, 22 per cent. Miosis, 25 per cent.

Well-marked irregularity of pupils, 25 per cent.

Paralysis of ocular muscles, 10 per cent.

Uhthoff's proportion of optic atrophy agrees with that stated by other authors, 8—10 per cent. It also agrees with the percentage found in tabes, although the absolute frequency of tabetic atrophy is ten times as great, which must mean that tabes is ten times as common as general paralysis. The author goes on to state the very striking fact that in only 5 per cent. of all cases of progressive optic atrophy has he failed, sooner or later, to detect signs of either tabes or general paralysis. Some of the remaining 5 per cent. were lost sight of, so Uhthoff holds the view that there is no such condition as uncomplicated optic atrophy. In other words, progressive optic atrophy is always a sign of tabes or general paralysis. He is unable to make any distinction between grey and white atrophy. The prognosis is always bad. Cases which remain stationary or unilateral are exceedingly rare, and awaken the suspicion that they are not true examples of progressive atrophy, but are secondary to basal syphilis, retro-bulbar neuritic processes. In these cases the prognosis is much better. In cases of optic atrophy it is essential to keep these basal lesions in mind, but exact diagnosis may be impossible.

The processes which take place in the optic nerve in both tabes and general paralysis are identical, the atrophy is always associated with changes in the spinal cord, especially of the posterior tracts. Cases of general paralysis with tabetic symptoms are more apt to show optic atrophy than those with purely cerebral paralytic symptoms (Torkel). The atrophy of the optic nerve is primary, and not, as some authors state, secondary to basal complications. The clinical symptoms of paralytic optic atrophy absolutely resemble those met with in tabetic atrophy. Hemianopsia of any kind is very rare in general paralysis and points to the co-existence of basal syphilis.

Temporal pallor is not a symptom of the disease, but is caused by coexisting alcoholism.

Optic neuritis, again, is caused by basal syphilis and hydrocephalus, not by general paralysis. The same is true of choked discs.

The macular changes described by Kuhnt and Wokenius have not been found by Uhthoff, nor does he believe that there is such a condition as "retinitis paralytica."

Forty-four per cent. of the author's cases suffered from Argyll Robertson pupil, and 8 per cent. of these had complete iridoplegia.

In 16 per cent. the light-reaction was sluggish, but care must be taken in using this symptom for diagnosis, because many other conditions which have nothing in common with tabes or general paralysis give rise to a defective light-reflex. The important point is the lack of normal correspondence between the light and convergence reflexes. Failure to recognise this fact has led to many errors. Collecting the statistics of 50 authors Uhthoff finds that 50·6 per cent. of all general paralytics had reflex or complete iridoplegia, 25 per cent. had abnormally reduced light-reflex, and only 18 per cent. showed the normal reaction to light.

A unilateral Argyll Robertson pupil has exactly the same significance as bilateral, both as regards diagnosis and prognosis.

Complete iridoplegia is not such an unfavourable symptom as reflex iridoplegia. It may be an isolated symptom of a past cerebral syphilis.

Inverse Argyll Robertson pupil, a pupil which reacts to light but not to accommodation, is occasionally met with in general paralysis, but it is a rare phenomenon. Uhthoff has never seen it.

Intermittence of the Argyll Robertson pupil in general paralysis is rarely seen, but has been described in association with improvement in the general symptoms of the disease. The author has not met with it, and suggests that the cases were not general paralysis but cerebral syphilis.

Anisocoria is frequent. Some authors note it in 64 per cent. of their cases, but Uhthoff has neglected minimal differences, which are not uncommon in healthy individuals, hence his figure is much lower—22 per cent. The same remark applies to irregularity in the shape of the pupils.

T. Harrison Butler.

VIII.—MONOCULAR DIPLOPIA.

Woelfflin, Ernst.—On the various causes of monocular diplopia. *Archives of Ophthalmology*, September, 1912.

Woelfflin summarises the causes of monocular diplopia as follows.—

1. *Cases without physical basis*, which are explained by the formation of a double fovea, such as is not uncommon in squinting eyes. He reminds us of Bielschowsky's interesting case in which the monocular diplopia disappeared, when the normal fovea finally excluded the pseudo-fovea from function.

2. *Cases with a physical basis.*—Of these there are the following varieties: (A) Diplopia which may be explained by Scheiner's test, *e.g.*, in cases of traumatic iridodialysis. (B) Cases which are due to irregular or regular astigmatism of the cornea, or, more often, of the lens. These are the most common. (A corneal fold produced by compression of the lids results in a rare form of diplopia due to corneal changes.) Woelfflin explains this form by assuming that, as the result of an irregular lental astigmatism, a point of light is seen as an irregular star, which is divided into two points of light by the addition of a regular corneal astigmatism. Sometimes the phenomenon appears only with a dilated pupil, when more markedly astigmatic portions of the cornea or lens are included in the pupillary area. A curious case is instanced as occurring in Dufour's clinic in which, following a paralysis of accommodation due to diphtheria, a diplopia was present only in the centre of the pupil (the centre of the lens showing an irregular refractive condition, the peripheral portions being normal), and was observable only at a certain distance from the eye (28 cm). One would expect cases of this kind to be present in keratoconus or lenticonus, but in three cases of keratoconus examined for diplopia, it did not exist. (C) Cases caused by asthenopia. These are probably due to accommodative changes. The diplopia only lasts a few hours in these cases. An interesting instance of this is the diplopia which has been observed in two cases after the prolonged use of one eye, as in microscopy, in the *other* eye. Woelfflin explains this by partial ciliary contractions adapted to give clearest visions in the eye in use and produced sympathetically in the other, resulting in an artificial lenal astigmatism. Cases of hysterical diplopia are probably due to improper accommodation, the increased nervous sensitiveness making the sensory impressions more marked. A unique case is quoted in which diplopia came on after an injection of morphia, and disappeared after eight hours. The weak miotic power of morphia is blamed for this. (D) Cases due to hysteria which can be cured by suggestive treatment. (E) Cases due to cerebral trauma. The diplopia usually disappears after a few weeks or months. (F) Diplopia which occurs in normal eyes, as the result of double reflection of the rays in the cornea, from the posterior surface to the anterior

and back to the fundus (Snellen), or as the result of decentration of the refracting media. The latter explanation seems the more likely, since Rochat, who observed the phenomenon on himself, found that with his pupil dilated, he could make the one or the other image disappear by screening the upper or lower half of his pupil. ROSA FORD.

IX.—TETANUS AFTER WOUND OF EYE.

Pincus, W.—Tetanus after perforating wound with foreign body in the eye. (Tetanus nach perforierender Augapfel-Verletzung mit Zurückbleiben eines Fremdkörpers.) *Centralbl. f. prak. Augenheilkunde*, Dezember, 1911.

Tetanus following perforating wounds of the eye is exceedingly rare. **Pincus**, of Budapest, reports the following case.

A man, aged 35 years, was struck in the left eye by the whip of a passing coachman. He immediately felt great pain in the eye, and when seen next morning, the eye was intensely inflamed, with great chemosis and some proptosis. Nasally, between the limbus and ciliary region, there was a purulent prolapse of the iris. The globe was very soft, on account of loss of vitreous, and was full of blood. No perception of light. The wound was cleansed, the prolapse removed. and the scleral opening covered by a conjunctival flap. By the following day the inflammation and chemosis had increased, there was pus in the wound, and the picture was that of a severe panophthalmitis. It was decided that as soon as the acute symptoms had passed off, the eyeball was to be removed. However, the condition became worse and the temperature rose. During the two following days, the proptosis increased, and on account of the possibility of orbital phlegmon, it was decided to remove the eye at once. The orbit was clear, and for the next two days the patient was better. Three days after, the patient complained of difficulty in swallowing and in opening the mouth. The next day there was great trismus, paralysis of the left facial and right oculomotor nerves, ptosis, etc., and so he was given 100 units of tetanus antitoxin. The condition gradually got worse, and the patient died eleven days after the injury. At the autopsy, no signs of meningitis or of pus in the orbit were found In the eyeball, behind the iris, was found the end of a piece of whipcord, 5mm. long and 3mm. wide.

It therefore follows that any perforating wound of the eyeball, contaminated with stable dirt or other material likely to carry tetanus infection, must be enucleated early, and the possibility of suppurative meningitis ought not to be allowed to weigh against this procedure, since the risk of this occurring is exceedingly remote. A. LEVY.

X.—RETINO-CHOROIDITIS JUXTA-PAPILLARIS.

Ormond, A. W.—Case of retino-choroiditis juxta-papillaris. *Proceedings of the Royal Society of Medicine*, December, 1912.

Ormond, of London, reports an interesting case, which is said by him to be clinically the same as those published, four in number, by Jensen of Copenhagen (Graefe's *Archiv*, 1909, Bd. LXIX, S. 41-48). The interest of the case is such that no apology is needed for the transcription of a large part of Ormond's account.

The patient, a male, aged 20 years, was first seen very shortly after the onset of the trouble. He was of athletic build, very fair, with peach-blossom complexion and long eyelashes. He had not suffered from rheumatism, although there was a family history thereof. There had been a discharge from the *left* ear for some years.

A week before being seen by Ormond, the patient had experienced some slight pain in the right eye, and two days later, found he could see very little with it. Ordinary external examination revealed nothing abnormal. There were various-sized opacities in the vitreous. The optic disc was hardly visible, owing to a soft, white mass which covered it and a small area of the retina above. The condition was at first supposed to be a papillitis, but further examination revealed a small patch of K.P., which led to the diagnosis of acute choroiditis close to but just above the optic disc. There was a very large defect in the field of vision below. It reached to within 15 degrees of the fixation point. The haze over the retina continued, and the K.P. became more marked. v. Pirquet reaction was definitely positive.

The question arose whether the condition was due to tubercle or to a septic focus resulting from the ear trouble. The ear was treated surgically, and three weeks after the first note, vision was 6/36 and the K.P. had entirely disappeared. The ophthalmoscopic changes were noted at intervals. Ten months after the first note the appearances were as follow:—"The whole disc has an oval shape with a fan-shaped white area above. The margins of the disc are surrounded by a soft white haze and the centre is still covered by some filmy exudation which can be seen coming forward into the vitreous. There are several streaks of exudation over the vessels and all are attached to the retina. The superior retinal arteries all show some alteration. Those going directly upwards and inwards are reduced to fine, almost invisible, threads, and the superior temporal ones are like 'gold wire' in appearance. The fan-shaped mass above the disc is obviously subsiding into a patch of choroido-retinal change, although the amount of pigment to be seen at present is *nil*, but the pale yellow colour and sinuous outline of such patches is well seen. The absence of pigment may be associated with the general fairness of the patient. The field of vision remains unchanged. Vision as before."

Ormond considers, although the diagnosis is complicated by the ear disease on the opposite side, that the ætiological factor in his case was probably tubercle. Jansen's cases were healthy and free from any taint of syphilis or gonorrhœa, but were not specially examined for tubercle. Ormond's patient did exhibit definite signs of tubercle.

The defective area in the field is clearly due, says Ormond, to the obliteration of a branch of the central retinal artery by the pressure of the inflammatory swelling. ERNEST THOMSON.

XI.—TRAUMATIC PARALYSIS OF THE OCULAR MUSCLES.*

(1) **Terrien.**—Traumatic paralysis of the common oculo-motor. (Paralysie traumatique du moteur commun.) *Archives d'Ophtalmologie*, janvier, 1911.

(2) **Ballantyne, Arthur J.**—Concomitant squint following injury to the head and eye. *Glasgow Medical Journal*, April, 1912.

(3) **Dutoit, A.**—Three cases with delayed and transient paralysis of the sixth nerve following fracture of the base of the skull. (Drei Fälle mit verzögerter und vorübergehender Lähmung des Abduzens nach Schädelbasisfraktur.) *Klin. Monatsbl. f. Augenheilkunde*, Oktober-November, 1913.

(4) **Baudry, S.**—A contribution to the medico-legal study of traumatic paralyses of the ocular muscles. (Contribution à l'étude médico-légale des paralysies traumatiques des muscles de l'œil.) *La Clinique Ophtalmologique*, 10 février, 1914.

(1) Penetrating wounds of the orbit caused by the point of an umbrella, a foil, knife, piece of wood, etc., may be arranged, in **Terrien's** opinion, in three main groups:—

1. Grave, usually fatal, cases where from fracture of the orbital wall, usually the upper, the meninges and frontal lobe are concerned. The signs may be at first latent.

2. Pulsating exophthalmos from a wound of the carotid in the cavernous sinus.

3. Lesions localised in the orbit in which there may be optic atrophy following an injury to the nerve, often complicated by paralysis of one or more of the motor nerves, generally the third. The injury may be direct or indirect through fracture at the optic foramen or more rarely an elongation of the nerve.

Terrien reports the following case.—A medical student of 22 years, received on November 6th, 1910, a blow in the left eye with the point of an umbrella. Ecchymosis of the lower lid and inner part of the upper followed, and almost immediately slight exophthalmos with complete ptosis. There was homonymous diplopia on raising the lid and the patient himself noted marked outward deviation. The exophthalmos and ptosis rapidly diminished, and he was seen on the 25th by Terrien, who noted a linear cicatrix at the inner side of the globe with all the signs of total but incomplete paralysis of the left third nerve; in addition, the fourth was slightly affected and possibly the sixth.

The patient suffered from neuralgic pains in the area supplied by the ophthalmic branch of the left trigeminal and some rather severe headaches on the same side. By early in January, however, the paralytic conditions had completely disappeared, the intrinsic muscles taking longer to recover than the extrinsic.

The probable cause was orbital hæmorrhage. That the intrinsic muscles took longer to recover is noteworthy but difficult to explain.

BERNARD CRIDLAND.

(2) The two cases reported by **Ballantyne**, of Glasgow, are examples of the conversion of heterophoria into heterotropia under the influence of a

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* See abstract of Fage's Communication on p. 360 of the present issue.

bandage applied to one eye. In the first case the bandage was applied on account of ecchymosis, etc., associated with a fracture of the skull, and in the second case on account of a "black eye" from a blow with a golf ball. There was a refraction error in each case, and the author carefully excluded the possibility of any genuine paralysis. In one case the squint disappeared without operation, and in the other as a result of operation.

ERNEST THOMSON.

(3) **Dutoit**, of Montreux, describes three cases of delayed paralysis of the abducens, following fracture of the base of the skull. In the first the diplopia came on four days after the injury, and had disappeared four days later. In the second case the paralysis of the sixth nerve was noted two days after the injury, and it had disappeared in seven or eight weeks. In the third case the dates were eleven days and seven weeks respectively.

As Panas pointed out, paralysis of the sixth nerve is usually associated with fracture through the apex of the petrous part of the temporal bone; it occurs immediately after the injury, being due to direct injury of the nerve, and the prognosis is very unfavourable. Paralysis of delayed onset is much less common, and is due to pressure on the nerve either by a hæmatoma or by callus. Naturally, the prognosis varies according to the cause. When this has been of the nature of a hæmatoma, recovery of function occurs with re-absorption of the blood; that is to say, within two months of the onset. When bony callus is the cause, the prognosis is bad. Sometimes formation of such callus may occur while the hæmatoma is undergoing absorption. In such a case the paralysis may remain for a time stationary, and then become more profound. A. J. BALLANTYNE.

(4) The article by **Baudry**, of Lille, forms a convenient synopsis of the various traumatic paralyses as they may occur after accidents of employment, and of the different forms of simulation and their detection. S. E.

XII.—OPERATIONS.

16.—Cataract.

(1) Taylor, H. F. Lechmere.—The diameter of the cornea, especially in its bearing on cataract extraction. *Indian Medical Gazette*, Vol. XLVII, p. 269.

(2) Reeder, D. F.—A method of dealing with the capsule after cataract operations. *Ophthalmic Record*, April, 1913

(3) Simpson, W. Likely.—The intracapsular operation for cataract after the method of Professor Stanculeanu, Bucarest. *Ophthalmic Record*, May, 1913.

(4) Krückmann.—Prophylactic covering of corneal wounds with conjunctiva in difficult lens extractions (Ueber die prophylaktische Bindehautdeckung von Hornhautwunden bei schwierigen Linsen-Extraktionen.) *Centralbl. f. prak. Augenheilkunde*, August-September, 1913.

(5) Leonida, Mlle. A.—The cataract operation when there is no anterior chamber. (Contribution à l'opération de la cataracte sans chambre antérieure.) *La Clinique Ophtalmologique*, 10 janvier, 1914.

(6) **Constantinesco, I.—On conjunctival advancement in the extraction of cataract. (Sur l'avancement de la conjonctive dans l'extraction de la cataracte.)** *La Clinique Ophtalmologique*, 10 février, 1914.

(7) **Poirault.—On the value of corneal suture (Kalt's method) in cataract operations. (Valeur de la suture de la cornée (procédé de Kalt) dans l'opération de la cataracte.)** *Ann. d'Oculistique*, février, 1914.

(1) This is a record by **Taylor**, of Jalalpur-Jaṭtan, Punjab, India, of the transverse diameter of the cornea in eyes operated upon for cataract in Northern India.

The series include observations upon one hundred and twenty men and forty-three woman, all adults of forty years and upwards. The measurements were taken with a sharp-pointed steel compass. They were as follows :—

10 millimetres	…	…	…	4 females
10—10·5 ,,	…	1 male		
10·5 ,,	…	12 ,,	…	9 ,,
10·5—11 ,,	…	4 ,,	…	3 ,,
11 ,,	…	57 ,,	…	22 ,,
11—11·5 ,,	…	15 ,,	…	2 ,,
11·5 ,,	…	12 ,,	…	3 ,,
11·5—12 ,,	…	5		
12 ,,	…	13		
12—12·5 ,,	…	1		
		120 males		43 females

In none of the eyes with corneæ of 10·5 mm. or less was intracapsular extraction practised. If 11 mm. be accepted as the standard for easy delivery of the lens in its capsule, more than five-sixths of the males, and well over three-fifths of the females, are up to the standard. The diameters of twenty-three lenses delivered in their capsules are given. There was one of 7 mm., one of 8 mm., twelve of 9 or 9·5 mm., eight of 10 mm., and one of 10·5 mm. This last was in a case of immature cataract of diffuse greenish type. The corneal diameter in this case was 11 mm. The operation and subsequent progress were uneventful. H. HERBERT.

(2) **Reeder**, of Ancon, from an extensive experience of cataract operations during the digging of the Panama Canal, finds that the following method of disposing of capsule gives excellent results, both in traumatic cases and in after-cataracts.—With the pupil dilated, a cutting needle is passed through the cornea near the margin, and the capsule is cut through at the pupillary margin on the opposite side. The needle is then withdrawn, and a small hook, similar to Tyrrel's iris hook, but with a sharp point and 1 mm. curve, is passed through the opening made by the needle on to the opening made in the capsule, which is then hooked out. No after-effects have been observed, and there is no loss of vitreous, even when it is in a fluid state.

J. JAMESON EVANS.

(3) **Simpson**, of Memphis, Tenn., describes procedures for extraction of cataract in the capsule as practised by Professor Stanculeanu, including the preliminary preparation of the patient. The latter includes a thorough cleansing of the nose, conjunctival sac, and the lacrymal passages, with excision of the sac or tying of the canaliculi where indicated. In the performance of the extraction a double-hook retractor controlled by an assistant is used instead of a speculum. The operation is always done in a dark room with the aid of a stationary electric light. The corneal

incision is a trifle larger than the ordinary, and the puncture and counter-puncture are made well back in the limbus and the incision is finished at the limbus with a small conjunctival flap. An iridectomy or an iridotomy after the method of Monolesco is now made. The next step is that in which the operation differs from all others. It consists in grasping the anterior capsule of the lens by means of a special capsule forceps. These forceps have no teeth to tear the capsule, which is grasped, not with the end of the forceps but at the most prominent part of the curve. The forceps are placed within the A.C. sideways and after getting them into the pupillary area they are opened up perpendicular to the surface of the capsule and by slight pressure backward a bite of the capsule is taken, and by making movements from side to side and up and down the zonular fibres are ruptured. The forceps are then removed. By continuous pressure with a spoon over the cornea below the centre and slight counter-pressure above, the lens in its capsule comes out. The iris is replaced before the lids are allowed to close. If the capsule tears in the forceps, the part gripped is removed and the extraction finished in the ordinary way. The older the patient, the easier the operation. It is contra-indicated if posterior synechiæ are present. J. JAMESON EVANS.

(4) The method of covering the corneal wound with conjunctiva, adopted by **Krückmann**, of Berlin, is essentially the same as that recommended by Kuhnt, of Bonn, with some small modifications. It consists in separating a conjunctival flap reaching from the limbus to within 2 mm. or 3 mm. of the fornix, leaving it attached at both ends. This flap is then undermined by a blunt-pointed probe, and the suture, which has been previously passed, draws this flap down over the wound. The essential part is that the flap edges be smooth, and the flap itself as thin as possible. It will remain in position for about a week, when it will slide back into its original place. A. LEVY.

(5) In the experience of **Mlle. Leonida,** of Bucharest, it has happened a number of times that a perfectly ripe cataract has had to be put off operation on account of extreme shallowness of the anterior chamber. In one case the cataract had been mature for seven years without any increase in the depth of anterior chamber.

The author says she will not speak of the many different attempts she has made to overcome this difficulty, without success, and does not even indicate their nature. But she is quite satisfied with the method she has eventually evolved and carried out successfully on a number of cases, apparently seventeen in all. This method consists in injecting into the anterior chamber, immediately prior to the cataract section, a small quantity of normal saline (·7 per cent.) Two cases are given in full, and it is stated that the other fifteen were quite similar.* In these two cases the cataract was extracted in the capsule after the method of Stanculeanu.

ERNEST THOMSON.

(6) **Constantinesco,** of Bucharest, describes in detail, but unfortunately without diagrams, his method of advancing the conjunctiva as a routine measure in the cataract operation. There does not seem to be anything very novel in the method, which consists essentially in dissecting up a flap of conjunctiva from the limbus prior to the cataract section, but the description of various technical faults and difficulties in the dissection, adjustment, and maintenance in position of the flap make one feel that the operation is unduly complicated, more so in all probability than is actually the case In order to be fully understood, the description should be read in the original. S. E.

(7) For a period of five years **Poirault** has assisted Kalt in all his cataract

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* See communication by N. Mulgund in THE OPHTHALMOSCOPE of April, 1914, p. 207.

operations at the Quinze-Vingts in Paris and been responsible for the after-care of the patients. He is a firm believer in the value of his chief's method of corneal suture, and urges in its favour the often claimed advantages that it allows simple extraction to be performed without risk of prolapse of iris, and that it is useful in limiting loss of vitreous should it occur. He gives a *résumé* of the operative results obtained by himself in over 200 cataract extractions, half with suture and half with iridectomy, which tend to show that with suture mechanical accidents do not occur, while with iridectomy they are not rare, and states that he never regrets having sutured the cornea, but sometimes regrets not having done so. He has had no experience of simple extraction without corneal suture, but considers that it is contra-indicated by the risk of prolapse of the iris, and he is totally opposed to intracapsular extraction. R. J. COULTER.

17.—The Eyelids.

(1) **Stevens, George.—An operation for improving the position and action of the eyelids in congenital and paralytic ptosis.** *Archives of Ophthalmology*, November, 1911.

(2) **Kumagai.—The fate of the cutaneo-cartilaginous ear graft employed in plastic operations on the eyelid.** (**Ueber das Schicksal des zur Lidplastik verwendeten Ohrknorpelhautlappens.**) *Klin. Monatsbl. f. Augenheilkunde*, Februar, 1912.

(3) **Terson père and Terson, J.—Exophthalmia** (**Graves' disease**) **with advanced necrosis of the right cornea and ulceration of the left cornea; bilateral suture of the eyelids.** (**Exophtalmie Basedowienne avec nécrose avancée de la cornée de l'œil droit et ulcération de la cornée de l'œil gauche; double suture des paupières.**) *La Clinique Ophtalmologique*, 10 juin, 1913.

(1) The special advantage of **Stevens'** operation, which he has performed successfully a number of times, is that the natural folds of the eyelids are not removed by the excision of any portion of skin—indeed they are rather accentuated. The incision is made along the whole length of the border of the eyelid, as nearly as possible to the row of cilia, but without injuring the roots of the lashes. The skin of the lid is then dissected up so as to uncover the whole extent of the "cartilage." The fibres of the elevator muscle of the lid are then carefully detached from their attachment to the "cartilage," and the free extremity drawn down by six fine sutures and attached to the tissues just above the line of incision. One end of each suture is cut close to the knot, the other is uncut. The skin is then brought back to its place and sutured, and the free ends of the muscle sutures are folded back and secured by a strip of court-plaster. In the case described, when the time came for removing the muscle sutures, this was done by slight traction on each, and the skin sutures were removed a day or two later. When healing had followed, no cicatrix was visible, and the lid was in a materially improved position. The result shown in the two photographs given is very satisfactory. ROSA FORD.

(2) **Kumagai,** of Tokio, reports a case operated on by Komoto's form of this operation, in which it was possible, at an interval of five months after the operation, to make a microscopical examination of a portion of the transplanted tissue. In this case the larger portion of the lower lid had to be

removed on account of carcinoma. A graft was obtained from the auricle, consisting of the cartilage covered on both sides with skin, of a size corresponding with that of the defect. A certain amount of the skin was cut away from the graft along its lower edge, and it was then stitched in position, the skin on its anterior surface being stitched to skin, and that on its posterior surface to conjunctiva. A considerable amount of shrinkage ultimately took place, but the result was good. Examination of a small piece, excised five months later, showed resorption of the cartilage cells, hyaline degeneration of the cartilage matrix, and penetration of the neighbouring connective tissue. A. J. BALLANTYNE.

(3) The **Tersons,** of Paris, relate the case-history of a baker of somewhat intemperate habits who suffered from Graves' disease, and who came to them, not on account of the general malady, but because his sight was deteriorating in the right eye. The failure of sight was found to be due to corneal ulceration and threatened panophthalmitis. Considering that excision of the eye would be very dangerous, whether done under local or general anæsthesia, it was determined to temporise if possible. The chemotic conjunctiva having been incised to allow of the lids being brought over the globe, the posterior edges of the palpebral borders were refreshed by successive cuts with fine scissors—the operation being difficult on account of the conditions existing—over a median length of nearly two centimetres, and united with four sutures. The effect of this intervention was to bring about subsidence of the threatened ophthalmitis and of the corneal infection. One month later, a small ulcer appeared on the left cornea, which hitherto had been intact. This threatened to extend, and so tarsorrhaphy was performed on this eye also. The ulcer cicatrised in eight days. By the use of an occasional drop of atropine, the patient was able to see round the obstruction caused by the tarsorrhaphy on this eye. The right eye was sightless. ERNEST THOMSON.

XIII.—REMEDIES.

(*Sixth Notice.*)

(1) **Jones, E. L.—Subconjunctival injections in ophthalmic therapy.** *Journal American Medical Association*, September 21st, 1912.

(2) **Scott-Moncrieff, W. E.—Five cases of senile cataract treated by subconjunctival injections of potassium iodide.** *Ophthalmology*, July, 1913.

(3) **Meding, C. B.—Subconjunctival injections of cyanide of mercury in ophthalmology.** *Ophthalmology*, July, 1913.

(4) **Wolffberg.—Fibrolysin in stricture of the lacrymal duct. (Fibrolysin gegen Strikturen des Tränen-nasenkanals.)** *Wochenschrift f. Therapie u. Hygiene d. Auges*, 21 August, 1913.

(5) **Meyer-Steineg, Theod.—On the question of the non-operative treatment of senile cataract. (Zür Frage der nicht operativen Behandlung des Alters-stars.)** *Wochensch. f. Therapie u. Hygiene des Auges*, 4 September, 1913.

(6) **Maxey, Edward E.**—Probable deleterious effect of salvarsan on the eye: review of literature and report of a case. *Ophthalmology*, October, 1913.

(7) **Eaton, F. B.**—The management of psycho-neurotic eye cases. *Ophthalmology*, October, 1913.

(8) **Davis, A. Edward.**—Choroiditis: some points as to ætiology and treatment. *Ophthalmology*, October, 1913.

(9) **Waldmann, Ivan.**—Heat penetration in ophthalmology. (Die Diathermie in der Augenheilkunde.) *Archiv für Augenheilkunde*, Januar, 1914, S. 1.

(10) **Peter, Luther C.**—The use of hot and cold applications in ophthalmic practice. *American Journal of Ophthalmology*, February, 1914.

(11) **Lawford, J. B.**—Case of severe post-operative plastic irido-cyclitis treated by neosalvarsan. *Proceedings of the Royal Society of Medicine: Section of Ophthalmology*, March, 1914.

(12) **Lang, William.**—Case of sympathetic ophthalmia from which a secondary cataract had been removed after the administration of salvarsan. *Proceedings of the Royal Society of Medicine: Section of Ophthalmology*, March, 1914.

(13) **Lang, William.**—Discussion of Salvarsan in Ophthalmic Practice. *Proceedings of the Royal Society of Medicine: Section of Ophthalmology*, March, 1914, p. 75.

(14) **Gibbard, T. W., and Harrison, L. W.** *Ibidem*, p. 84.

(15) **Browning, S. H.** *Ibidem*, p. 88.

(16) **Elliot, R. H.** *Ibidem*, p. 98.

(17) **Henderson, E. Erskine.** *Ibidem*, p. 102.

(18) **Fleming, Alexander.**—*Ibidem*, p. 103.

(19) **Dutoit, A.**—On the treatment of optic neuritis. (The neurotropic action of lipoiodine.) [Sur le traitement des névrites optiques (action neurotrope de la lipoiodine).] *La Clinique Ophtalmologique*, 10 avril, 1914.

(1) **Jones**, of Cumberland, Md., U.S.A., confesses himself a convert to the views of Darier on this subject. Not only so, he seems to go further than Darier in the heroic nature of the measures employed. He believes, as he says himself, "in one strong sledge-hammer blow instead of tack-hammer licks, to which the daily or tri-weekly injections of salt solution, usually recommended, might be compared." Authors often speak of one or two or five drops of certain solutions. Jones employs 2 cc. or 30 minims of fluid, regardless of its composition, the age or condition of the patient, or the nature of the disease or injury treated. One of the chief essentials of success is the distention and flushing of the lymph channels. The standard basis of the injections is cyanide of mercury 1 to 1,500, sometimes it is used double strength. Acoin alone was at first used as an analgesic, but latterly Jones has added morphine and dionine. Acoin is so easily decomposed by alkalis that it is kept in the form of a stock powder composed of one part acoin, one part boric acid, and four parts of salt (presumably common salt). About one-half grain of this is dissolved in 2 cc. of 1 to 1,500 cyanide. In cases not already painful

one eighth of a grain of morphine and the same amount of dionine are added. In cases in which there is already severe pain, the amount is doubled. Atropine, 1/100 grain may be added if required to dilate the pupil. The results of this injection are somewhat alarming to the patient, who must be warned what to expect, and the side of the face as well as the eye kept bandaged and out of sight of him or his friends. Swelling rapidly extends to the lids, and frequently to the entire side of the face, down under the chin and to the opposite side. At this the surgeon need not be alarmed. Chemosis for several days may conceal all the cornea except a small pupillary area. Only once out of hundreds of such treatments has the conjunctiva necrosed, and then over a small area which rapidly granulated with just the same amount of adhesion of conjunctiva to globe as would in any case have occurred, namely, over an area of about the size of the little finger nail. The injection is made between recti muscles, and as far away from the cornea as possible. Small children may be given a general anæsthetic, but they stand the same amount of fluid as an adult. The majority of cases require only one treatment. Obstinate cases do not have the treatment oftener than once or twice a month. According to the author, by far the largest use for this procedure is in advanced or dangerous corneal ulceration. He does not use it in cases which are doing well under ordinary treatment. In bad cases not only is healing more sure and rapid than by other methods, but the cornea is remarkably clear afterwards.

After having given us the details of the method and its action on corneal ulceration, Jones relates in full the case-histories of a score of patients treated for other conditions. These are: sympathetic ophthalmitis, choroiditis, tuberculous tumour of the choroid, interstitial keratitis, keratitis with uveitis and raised tension, inoperable glaucoma following retinal hæmorrhage, episcleritis, retrobulbar neuritis, double optic neuritis, and injuries of various kinds. The accounts of these cases will repay study in the original, as the results, in many instances, are sufficiently striking.

The author confesses that he has no theory satisfactorily to explain the curative power of these injections. In inflammatory troubles they are antiphlogistic; in indolent conditions they increase circulatory activity; in septic troubles they check sepsis. He considers that it is not drug action in itself, but some process in which drugs merely figure. We may use the modern terms of "raising the opsonic index," "increasing the antibodies," etc., or we may fall back on the term used by our forefathers, "increasing the *vis medicatrix naturæ*."

ERNEST THOMSON.

(2) **Scott-Moncrieff,** of Victoria, B.C., employed subconjunctival injections of a few minims of 1 per cent. solution of potassium iodide. Two cases showed improvement; one remained stationary for two and a half years; and the result in the others was uncertain. He thinks the method worthy of trial.

A. J. BALLANTYNE.

(3) **Meding,** of New York, has used this treatment in two hundred cases which included examples of vitreous opacities, trachomatous pannus, indolent ulcer, hypopyon-ulcer, recent corneal opacity, parenchymatous keratitis, episcleritis and scleritis, and sympathetic ophthalmia. From 10 to 20 minims of a 1 in 4,000 solution of cyanide of mercury in sterile water were injected. His results have been satisfactory, and he believes that this salt is better than sodium chloride, mercury bichloride, and others which have been tried. Where this treatment was employed, no other measures were used. The experience was gained in India, where the method is peculiarly applicable, owing to the difficulty of getting the patients to give continued attendance.

A. J. BALLANTYNE.

(4) Ten cases of blennorrhœa of the lacrymal sac with stricture of the nasal duct, impermeable by even the finest probe, form the subject of this contribution by **Wolffberg**, of Breslau, who cites one case as an example of all—a woman, who attended daily for three weeks at first. The canaliculus was slit, the pus pressed out, the sac syringed with peroxide of hydrogen suprarenin-cocain solution introduced by the Anel's syringe, and probing attempted. The finest probe did not pass. Continued syringing got rid of the suppuration. Patient discharged still uncured. She returned with relapse of the suppuration. This was deeply seated in the nasal duct, and was again syringed out with the Anel's syringe. Sounding again failed, extirpation was refused, and patient again dismissed with only relative healing. The patient came for the third time with the same condition as before. After repeating the former procedures and again failing to pass a probe, a few drops of fibrolysin were introduced at the seat of the stricture by means of the Anel's syringe. Merck's special preparation for use in eye work was adopted. The pain was minimal. About fifteen minutes after the injection, a probe was tried and advanced; on repeating the process the following day, the probe passed smoothly. The duct was then irrigated by means of Anel's syringe. The treatment was kept up for fourteen days, when healing was complete.

The other nine cases were similarly successfully treated by these means.

E. J. PRIMROSE.

(5) After recalling the fact that opacities of the lens often disappear spontaneously, and can also be influenced by therapeutic measures, and expressing surprise that oculists have not hitherto made more use of this knowledge, **Meyer-Steineg**, of Jena, relates how he was himself led to do so by reflection upon what he had observed two years before in a case of considerable change in the retina and choroid with opacities in the vitreous and lens. Under the internal administration of iodine and the local application of potassium iodide, the opacities in the vitreous cleared up, and also those in the lens to a very considerable extent.

For the past four months he has treated every case of senile cataract that was not too far advanced, and has had 13 patients (25 cataractous eyes) under treatment. The extent, situation, and kind of cataract were various, and the vision ranged from 5/6 to 5/50. Result, in 5 of the 25, nil; in the other 20, unmistakable, consisting (*a*) subjectively of an improvement of vision in the most favourable, of from 5/15 to 5/6; in the least favourable, of from 5/50 to 5/30 (*b*) objectively of a disappearance of lens opacity as established by the ophthalmoscope. Cases of grey cataract having no sharp margin, and with more or less fine streaks extending from their densest spots into the clear lens-substance, were all seen to clear up; the black cataracts very seldom.

The treatment was: (1) *Locally*, the daily instillation of sodium iodide, 1/4 to 1/2 per cent. solution (stronger solutions were known to have aggravated the cataract). In five cases where this was without effect, dionin 1/2 per cent. was used along with the 1/2 per cent. sodium iodide and once every eight or ten days the surgeon instilled 2 per cent. dionin solution. This addition achieved a remarkable effect. What suited one did not necessarily suit another. (2) *Generally*, the endeavour to obtain a resorbent effect by the internal administration of iodine. Iodoglidine was used on account of freedom from unpleasant effects. The doses were 1/2 a tablet daily, increased in the course of a week to 1 or 1½ tablets daily, and then reduced again to 1/2 a tablet. After an interval, the course was repeated. In several cases where no effect was obtained, a dry diet was enforced for some days, and copious draughts of alkaline water were administered for a considerable time thereafter, while once a week sweating was induced by means of aspirin and draughts of hot tea, the patient being meanwhile in bed. Directly following this regime rapid retrogression of cataract was observed. In general, if a result follow, it is seen during the first month. As to permanence, nothing can yet be said, but if cataract should again form after a lengthened interval, the latter will have afforded welcome relief from the most insufferable tedium in many cases. E. J. PRIMROSE.

(6) **Maxey**, of Boise, Idaho, states that hitherto no case has been reported of damage done by salvarsan to the eye of a non-syphilitic subject. In syphilitics there have been numerous instances of lesions occurring in healthy eyes after injections of salvarsan. These have been attributed by Ehrlich and others to a supposed irritating or stimulating effect exercised by the salvarsan upon spirochætes situated in certain inaccessible spots. That the lesions are not due to a toxic action of the drug is proved in many cases by the curative effect of repeating the injection. The ocular lesions hitherto reported include disease of the retinal vessels, optic neuritis, neuro-retinitis, iritis, choroiditis, iridocyclitis, paresis of the third nerve, and optic atrophy. The case which the author reports was one of chorio-retinitis with vitreous opacity, following injection of salvarsan.

In the discussion which followed the reading of the paper, at a meeting of the Pacific Coast Oto-Ophthalmological Society, Davis, of New York, expressed the opinion that the complication in this case might be due to faulty *technique* (the drug had been administered intramuscularly in oil). He believed that salvarsan had no deleterious effect on the eye when properly given. A. J. BALLANTYNE.

(7) **Eaton**, of Portland, Oregon, shows that in many patients complaining of eyestrain, etc., the immediate cause of the symptoms is a neurosis of some kind, for example, the "anxiety neurosis" of Freud. Thus, a young lady, wearing a suitable and comfortable correction, developed symptoms of eyestrain which the author was able to trace to anxiety with regard to an approaching examination. Other examples are quoted. The author expresses the opinion that it is the duty of the oculist, not only to prescribe accurate correcting lenses, but also to gain the confidence of the patient, ascertain the underlying cause of the symptoms, and treat it by "optimistic persuasion" and suggestive methods, such as high frequency currents, etc.

A. J. BALLANTYNE.

(8) This paper, by **Davis**, of New York, is a plea for a more careful search for the cause in cases of exudative and non-suppurative forms of choroiditis. Too often the case is labelled "syphilitic" or simply "idiopathic" for want of careful investigation. The importance of the patient's history and of the lungs, stomach, and other organs should not be forgotten, and great help may be received from the special tests of the blood and urine, and from the use of sera and vaccines. The cases reported by the author point to the influence of tubercle and oral sepsis. Treatment should be on the lines suggested by the diagnosis, and may include tuberculin, vaccines, serums, salvarsan, etc. The usual local measures will also be employed. A. J. BALLANTYNE.

(9) **Waldmann** refers to Hertel's work on the temperature of the conjunctiva in animals and man, and says the difference in the behaviour of warm compresses is due to anatomical differences. The eye of the human, for instance, lies deeply in the orbit and is accessible only from in front, while the eye of the guinea pig stands out much freer and in this way can be subjected to the effects of temperature from every side. Waldmann gives in detail his experiences with treating Spring catarrh, trachoma, episcleritis, keratitis, and iridocyclitis, and closes his article with the following words:

From my experience, I wish to emphasize that in heat penetration, we have found a good way by which we can conduct heat to the human body, or its cells, without harmful secondary effects, and by which one can regulate the quantity of the heat and the time of its effect as one likes. The process consists most probably in a hyperæmia, in a quickening of the body fluids, in increase of the metabolism of the cells, whereby absorption of exudates is made possible. HANFORD MCKEE.

(10) **Peter**, of Philadelphia, discusses the use of hot and cold applications. Water is in both cases the best medium. That is to say, neither actual ice application, on the one hand, nor poultices, on the other hand, should be used. Dry heat, as by electrical appliances or the Japanese "hot-box," is no improvement upon water application. Cold is useful immediately after injury, and seems to be the best form of application in the early stages of gonorrhœal ophthalmia. Heat has a wider range of applicability, and according to the author, when in doubt as to which measure to use, heat is always dependable. S. E

(11) The case reported by **Lawford**, of London, was one of plastic iridocyclitis, the first signs of which were noticed six days after an uncomplicated extraction of senile cataract. The injection of mixed staphylococcus stock vaccine having failed, 0·9 grm. of neo-salvarsan was injected intra-venously, and two days later, there was some improvement. A relapse was met by the exhibition of the same remedy in the same dose. The patient, after an iridectomy downwards, recovered sight of 6/12ptly. and No. 4 J.

SYDNEY STEPHENSON.

(12) The case brought forward by **William Lang**, of London, was originally under the care of Rolston, of Plymouth. The last-named had removed the patient's eye for gunshot wound. Fifteen days later, there was iritis in the remaining eye. Sight improved under treatment, but soon again failed, and when the patient was first seen by Lang, about two-and-a-quarter years after removal of the exciting eye, there was good p.l., although the patient had to be led about. Lens cataractous, and pupil "occluded." Two injections of salvarsan, 0.6 grm., were given at an interval of fourteen days, and about four months after the last injection, the lens was extracted with some difficulty. At a later period, an iridectomy was performed. Result: V.=5/24 and No. 2 Jaeger. Through the clear pupil made by the iridectomy, extensive, superficial choroidal atrophy could be recognised. SYDNEY STEPHENSON.

(13) **William Lang**, of London, first described how salvarsan (or neo-salvarsan) acted upon protozoal organisms in such a way that the tissues of the body could kill them. He then passed forward to consider the dose and method of giving the drug, including the *technique* of administration. "Provocative" doses of salvarsan, administered in the hopes of obtaining a positive Wassermann reaction, were touched upon. The indications for treatment were carefully outlined. Finally, Lang explained how it came about that he (in consultation with Browning), was the first to employ salvarsan in the treatment of sympathetic ophthalmitis at Moorfields Hospital, London.

(14) **Gibbard** and **Harrison** do not for a moment suppose that salvarsan has a poisonous action on cerebral nerves. It is possible that interstitial keratitis is more resistant to salvarsan than is syphilitic iritis, because the cornea is further removed from the circulation than are the tissues of the iris. It is, however, possible that the explanation may be found in the production of resistant strains of the *Spirochæta pallida* in some phase of its developmental cycle. The authors record a case of paralysis of the ophthalmic division of the fifth nerve, which followed six months after a single injection of salvarsan. Improvement followed small repeated injections of salvarsan, in conjunction with mercury.

(15) Some three years ago, **Browning**, of London, noticed that sympathetic ophthalmitis gave a certain type of differential blood count, in that the blood showed a marked increase in the number of non-granular leucocytes, and a decrease in the granular cells. The increase in the non-granular cells was marked also in the large mononuclear leucocytes, sometimes called hyaline cells, and including the transitional cells. This brings the blood count in sympathetic ophthalmitis into line with that observed in most of the protozoal diseases, including malaria, syphilis, kala-azar, trypanosomiasis, and anchylostomiasis, an observation that led to the treatment of a patient (belonging to William Lang) with sympathetic ophthalmitis by means of salvarsan in February, 1911.

Browning now gives the details of twenty cases of sympathetic disease treated with salvarsan (dose 0·6 grm.); but with a few very marked exceptions, the results have not been striking. From one to seven doses have been given. Twelve of the cases occurred as a sequel to cataract extraction. To nine of the patients neosalvarsan was given, and to the rest salvarsan.

Browning had experienced wonderful results from salvarsan in some cases of very slow pyogenic infection after cataract extraction. He drew attention to the fact that a typical blood count might precede the development of sympathetic ophthalmitis. The method could then be employed from the point of view of prognosis. At the same time there were fallacies, and he recalled about five cases in which the typical blood count was not apparent.

(16) **Elliot,** of London, was one of the first in India to employ "606." He had never met with optic atrophy after the use of the remedy. Optic neuritis of syphilitic origin reacted well to salvarsan. He believes that the arsenic is eliminated from the system in about ten days. If patients therefore be kept under observation for a period of two or three months, without evidence of optic nerve trouble, we need probably have no further cause for anxiety on that score. The doses adopted were calculated on the bodily weight of each patient, 0·50 grm. being recommended for a subject weighing 150 lb. In a number of the Hindus treated it was necessary to expose a vein by means of a small incision. Mercury and iodides were always given at the same time as the salvarsan treatment. In the earlier days of "606" Elliot knew of two deaths hastened, if not caused, by the drug.

(17) **Henderson**, of London, described two cases of late infection after cataract extraction, in which salvarsan had been most valuable after the failure of the more commonly recognised methods of treatment. The condition looked very desperate in both cases before salvarsan (or neo-salvarsan) was employed.

(18) **A. Fleming**, of London, did not believe that salvarsan "had an evil effect on any eye." He preferred salvarsan to neo-salvarsan, inasmuch as the results both as regards the symptoms and the Wassermann reaction seemed to be decidedly better with the older drug. It was never necessary, he thought, to cut down upon a vein. Fleming had not seen any benefit in interstitial keratitis from salvarsan. After injection he had seen the Argyll Robertson pupil become normal.

Some other speakers took part in the discussion :

Rayner Batten, of London, enquired whether Browning considered that the blood condition might perchance be present prior to the development of the sympathetic ophthalmitis; and **E. Treacher Collins**, of London, asked in what proportion of cases of sympathetic disease Browning found that the typical blood count was not present. **Paton**, of London, feared that if undue dependence was placed on the blood count, as described by Browning, eyes might be removed that could be saved by perseverance. **Basil Lang**, of

London, discussed the varying blood count found in children until well beyond the advent of puberty. **J. H. Parsons,** of London, also spoke. **Sir Anderson Critchett**, of London, hoped that the discussion (over which he had presided) might strengthen the confidence of the profession and the public in that most valuable remedy, salvarsan. SYDNEY STEPHENSON.

(19) The article by **Dutoit**, of Montreux, is essentially one setting forth the numerous advantages of the new iodine compound, lipoiodine. We shall leave our readers to study in the original the views of Dutoit as to the temporary fixation of the iodine in fatty and nervous tissues, and the consequent advantages of the preparation. Lipoiodine is an ethylic ether of a bi-iodised non-saturated higher fatty acid known (in French) as *acide biiodobrassidique.* Its formula is $C_{19}H_{39}CI{=}CI{-}COOC_2H_5$ S. E.

BOOK NOTICES.

General and Practical Optics. By LIONEL LAURANCE. Pp. 363. Published by the Author, Temple House, Temple Avenue, London, E.C Second and Revised Edition. 1914. Price, 10s. 6d.

This book is primarily intended as a text-book for candidates for the examination of the Worshipful Company of Spectacle Makers, and contains much useful information that is not found in the ordinary text-books on optics. For instance, five different forms of photometer are described, and we are glad to find an adequate description of the Lummer and "Flicker" photometers, as well as a description of the different forms of standard lights:—the British candle, the Carcel, the Hefner, the Violle, and the Bougie-décimal,—with their relations to each other.

The notation adopted is not that used by mathematicians, and although it offers no difficulties to the reader, it seriously limits the value of the formulæ given. For instance, the distance PF_1 on p. 73, is called the first focal distance and is denoted by F_1, while the distance PF_2 is called the second focal distance F_2, and yet these distances, although measured in opposite directions, carry the same sign. Consequently, the expression for magnification ($M = \frac{F_2}{f_1 - F_1}$ on p. 80) does not tell us whether the image is erect or inverted, which is told us at once by the sign of the expression in the usual formula. On p. 82 we read "the image f_2 is negative or virtual, and on the same side of the surface as f_1." The customary usage regards distances on the same side of a surface as carrying the same sign. However, there is no doubt that one who accustomed himself to this notation, would, with care, make no mistakes, but the ordinary mathematical notation, when consistently used, demands much less care and is far less liable to give rise to error. The Gauss equation for the determination of cardinal points is dealt with in a not uncommon way by the method of convergents. It is sound, but it is by no means the simplest way of dealing with the question.

It is with pleasure we notice that approval is given to the standard notation of cylinders which was recommended by the Optical Society, and which is universally used by all mathematicians:—*i.e.*, the O mark is placed for each eye to the patient's left, and the angles are measured counterclockwise from this horizontal zero line. We do not see why the method of indicating the axis with a stroke should be so condemned, unless, indeed, the number of degrees is also omitted; this, of course, would be unpardonable.

We wish the book every success. In a future edition a little more space might be given to higher optics; the remarks about the sine condition, and the Petzval condition are very cursory; and no information is given to microscopists about numerical aperture and many other things that they should know. There are several useful tables in the appendix, including a most convenient table of $\sin^2\theta$ and $\cos^2\theta$. On p. 360 a note should be given to indicate the peculiar values given to a and b in the ellipse, as they have twice the values usually allotted to them. A. S. PERCIVAL.

The Anatomy of the Brain: A Manual for Students and Practitioners of Medicine. By J. F. BURKHOLDER, M.D., Professor of Ophthalmology, Loyola University. Engelhard & Co., Chicago. 1912.

Professor Burkholder has written for students a small dissecting guide and descriptive atlas of the brain, "the brain of the sheep being selected for description and illustration because of its availability and its practical identity with the human brain for laboratory use."

The work falls into two parts: there are a hundred pages of descriptive text containing directions for dissection, followed by and based upon forty full-paged plates grouped together at the end. These plates, a commendable feature of which is the use of extra large identification letters, are made from original drawings by the author. In the text, instructions are given first how to remove and prepare the brains for dissection. Specific directions for the study of unstained sections of the brain are given, and the value of the tearing process in facilitating the study of the larger bundles of nerve fibres is emphasised. No structure is described that cannot be seen by the aid of a hand lens. The chief addition to this, the second edition, is the study of the relationships of the component parts of the brain stem, which should prove as useful in learning the architecture of the corresponding region of the human brain as the grosser parts have been.

The use of sheep brains relieves the difficulty usually experienced from the scarcity of human material, and each student can be provided with several specimens. The chief differences between the two types of brain are first pointed out and are readily recognised. The details are noted in the text as they appear in the course of dissection. The use of such easily obtained material is occasionally resorted to where human brains are difficult to provide in any quantity, but such a clear and admirably illustrated dissection guide has been wanting hitherto. It should prove a most valuable introduction to the study of the anatomy of this region, and the student will derive much benefit from following such a preliminary dissection before undertaking the more important work.

The Basle nomenclature, which now appears almost universal in anatomical works, is used, although the older and better known terminology is given in brackets in each case. S. E. WHITNALL.

The Question of Detachment of the Choroid after Cataract and Glaucoma Operations. (Zur Frage der Aderhautabhebung nach Star-und Glaukom-Operationen.) By Dr. BOIT. *Vossius' Sammlung zwangloser Abhandlungen aus. dem Gebiete der Augenheilkunde.* Bd. IX, Heft vi. Halle A.S.: Carl Marhold, Verlagsbuchhandlung, 1914. Price, 1 Mark.

The condition which forms the subject of Boit's *brochure,* although recognised by Knapp as early as 1869, was first carefully investigated and described by Fuchs in 1900.

After a certain proportion of cataract extractions, with or without iridectomy, and of iridectomies for glaucoma, there is observed, a few days after operation, a sudden diminution in the depth of the anterior chamber, a fall of ocular tension, and one or more localised elevations of the choroid. These are situated far forward and take the form of dark, hemispherical, sharply-defined projections. They are usually situated at the nasal or temporal side or both. The disappearance of the detachment, which usually occurs within a short space of time, is accompanied by the return of the anterior chamber to its former depth and the rise of the tension to normal. There may even be a transient elevation of tension above normal. The prognosis, as a rule, is good in every respect.

Fuchs came to the conclusion that the operation led to a mechanical loosening of the attachment of the ciliary body, so that the aqueous was able to find its way into the perichoroidal space, thus driving the choroid forward into the vitreous chamber. His theory was supported by later observations, both of choroidal detachment and of the dehiscence of the ciliary body, in microscopical preparations. As a rule, the subchoroidal fluid in these cases was serous, but in some blood was found.

In the year 1902, Schüler, of Freiburg, reported a case of glaucoma in which, three days after iridectomy which ran a normal course, and without reopening of the wound, a shallow choroidal detachment appeared, accompanied by hypotony, shallowness of the anterior chamber, and disappearance of the glaucomatous cup. Six days later, the choroidal detachment subsided, and along with this, there was elevation of tension and return of the cupping.

Demaria, in 1904, had the opportunity of examining microscopically the eye from a case of glaucoma in which choroidal detachment had followed iridectomy. He found a direct communication between the anterior chamber and the perichoroidal space through a dehiscence like that assumed by Fuchs. The rupture also laid open the canal of Schlemm. It was situated opposite to the side on which the iridectomy was performed. The contents of the subchoroidal space were chiefly blood. The hæmorrhagic form of choroidal detachment was also found by Fischer after iridectomy for absolute glaucoma.

More recently Meller has investigated the conditions following the sclerecto-iridectomy of Lagrange and the trephining of Elliot, and has found that detachment frequently follows both these operations. He has propounded a new theory to account for the occurrence. According to this, there are two factors responsible for it.—In the first place, the shrinkage of the vitreous which follows evacuation of the aqueous, with or without removal of the lens, is a mechanical factor which tends to draw away the retina and choroid from the relatively rigid sclera. Secondly, after removal of the aqueous there is an active secretion from the ciliary processes, which, he says, leads to congestion in the ciliary body and transudation of fluid into the perichoroidal space. At a much earlier date, C. D. Marshall, of London, had also formed the opinion that the secretion of a serous fluid beneath the choroid was the effectual cause of the detachment.

After thus reviewing the literature of the subject, Boit proceeds to record some observations of his own. In the first place, he gives an account of the clinical and pathological findings in two cases of expulsive hæmorrhage. In view of the fact that in some recorded cases of post-operative choroidal detachment the subchoroidal fluid was composed either partly or entirely of blood, there is sufficient ground for assuming a relationship of some sort between these two conditions. In the cases of expulsive hæmorrhage the author found no dehiscence of the ciliary body and no separation of its attachment to the sclera. His second group embraces seven cases in which Elliot's trephining operation was performed, and in which elevation of the choroid afterwards appeared. One of these presented the phenomenon recorded by Schüler, namely, disappearance of the disc excavation with the onset of the choroidal separation, and its reappearance when the separation subsided. In three of the cases the author was able, with the aid of transillumination, to ascertain the presence of a dark object in the subchoroidal fluid in the lowest part of the detachment, which he assumed to consist of blood. In a third group he places one case of choroidal detachment following extraction of cataract, one after extraction and iridectomy in subluxation of the lens with glaucoma, and one after iridectomy for glaucoma. In all of these the condition ran the usual course. Transillumination showed that the choroid was elevated by a clear serous fluid, with the addition of some blood in one of the cases.

Where blood is detected in such cases, either clinically or microscopically, Boit believes that it results from the rupture of the small vessels crossing the suprachoroidal space, which is due to dragging on the choroid when the aqueous is allowed to escape. It is, indeed, a minimal form of expulsive hæmorrhage.

In reviewing his cases in the light of the different theories which have already been propounded, the author, apparently, finds that none of these is entirely satisfactory, and at the same time has nothing new to put in their place. Of all the theories, he finds that of Fuchs the least satisfactory, since there is not evidence to show that the dehiscence referred to is always present, and in such an operation as the trephining of Elliot nothing occurs to lead to its formation, His general conclusion is that the symptoms, anatomical facts, and physiological possibilities, point rather to the occurrence of a serous subchoroidal exudation than to a change in the position of the aqueous as the cause of post-operative detachment of the choroid. A. J. BALLANTYNE.

CORRESPONDENCE.

[While THE OPHTHALMOSCOPE will at all times welcome correspondence from its readers, the Editor does not hold himself responsible for any views expressed in this column.]

EYE INJURIES FROM EYEGLASSES.

To the Editor of THE OPHTHALMOSCOPE.

Dear Sir,

On receiving the April number of THE OPHTHALMOSCOPE I read with interest the article, "Eye Injuries from Eyeglasses," by Hans Lauber. The rarity of such accidents occurring in so large a number of patients was very noteworthy, and the article served as a concise exposition of a subject which has, I think, been little touched upon. The article was a very timely one to me, as I happened to have under my care at the time such a case.

The facts, briefly, are as follows:

A young male adult, wearing rimless eyeglasses (—1·50 D. sph. O.A.) was, during a game of curling, struck on the right eye with the end of a broom-handle. The blow was a heavy one. The right lens was shattered, fragments of glass being driven into the eye. Rather free bleeding occurred and the eye was found to be sightless. Examination showed slight puffiness of the upper lid with a small cut at the border on the nasal side. On separating the lids, aqueous, mixed with blood and some vitreous, was found in the cul-de-sac. A gaping incised wound of cornea and sclera was present about a centimetre in length, and through this appeared prolapsed uveal tissue. After a conference with a *confrère*, enucleation was undertaken. No fragment of glass was found in the globe.

Possibly the rarity of this form of accident may make this note of interest.

Yours truly,
PERCY G. BELL.

613, BOYD BUILDING,
WINNIPEG.
May 1st, 1914.

A NEW HANDLE FOR GLAUCOMA TREPHINE BLADES.

To the Editor of THE OPHTHALMOSCOPE.

SIR,—Will you most kindly allow me to make a correction in connection with the "New Handle for Glaucoma Trephine Blades" described in your April issue. The weight of this should read 2·5 drachms (9·7 grammes), and not half an ounce. Regretting the mistake.

Yours truly,
R. H. ELLIOT.

143, HARLEY STREET, LONDON, W.
May, 1914.

THE OPHTHALMOSCOPE DIARY.

	1914.	
Section of Ophthalmology: Royal Society of Medicine.	June 10th	London.
American Medical Association: Section of Ophthalmology.	June 22nd to 26th	Atlantic City
Midland Ophthalmological Society.	June 30th	Birmingham.
Oxford Ophthalmological Congress	July 8th to July 10th	Oxford.
British Medical Association: Section of Ophthalmology.	July 29th to July 31st	Aberdeen.
International Congress of Ophthalmology.	August 10th to August 15th	St. Petersburg.
American Academy of Ophthalmology and Oto-Laryngology	October 19th to October 21st	Boston, Mass.

NOTES AND ECHOES.

Deaths.

WITH deep regret we chronicle the death of John Abercrombie, which occurred on April 30th, at Augill Castle, Brough, Westmorland, whither he had retired some nine years ago. Abercrombie had been the incumbent of several important medical appointments in London, including the physiciancy to Charing Cross Hospital. He was at one time closely connected with the Ophthalmological Society of the United Kingdom, of which he was secretary (1882-5), councillor (1885-8), vice-president (1897-8), and treasurer (1898-1906). Several communications from his pen will be found in the earlier numbers of the Society's *Transactions*.

From Königsberg the death is announced in the sixty-fourth year of his age of Max Berthold.

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Appointments.

MR. R. FOSTER MOORE has been appointed assistant surgeon to the Royal London Ophthalmic Hospital (Moorfields).

Mr. R. A. Greeves has been appointed assistant ophthalmic surgeon to the Middlesex Hospital, London, in succession to Mr. Arnold Lawson, now ophthalmic surgeon to the hospital.

On his acceptance of an appointment as ophthalmic surgeon to the County of Lanark Education Committee, Dr. Ernest Thomson, sub-editor of THE OPHTHALMOSCOPE, has resigned the post of surgeon to the Glasgow Eye Infirmary.

Dr. Andrew Wilson has been appointed lecturer on ophthalmology in the Glasgow Western Medical School, in succession to Dr. James Hinshelwood.

The following appointments have been made to the North Staffordshire Infirmary :—

Mr. H. H. Folker, consulting ophthalmic surgeon; Mr. R. H. Dickson, ophthalmic surgeon; and Mr. S. McMurray, assistant ophthalmic surgeon.

Mr. A. C. Hudson has been recognised as a teacher in ophthalmology by the Senate of London University.

Mr. W. Peach Taylor has been appointed surgeon to the Bristol Eye Dispensary.

Mr. Angus MacNab has been reappointed by the Metropolitan Asylums Board for another year as consultant in connection with eye cases in mental hospitals at an inclusive fee of five guineas per visit, the maximum number of visits in respect of all the institutions to be twenty.

Mr. T. W. Letchworth has been appointed ophthalmic surgeon to out-patients at the Hampstead and North-west London Hospital, and to the Hospital of St. John and St. Elizabeth, Regent's Park, London.

Dr. E. W. Assinder has been appointed pathologist to the Birmingham and Midland Eye Hospital.

Mr. Richard Williams has been appointed medical referee under the Workmen's Compensation Act. 1906, for County Court Circuit No. 29, with a view to his being employed in all ophthalmic cases in the circuit in which the services of a medical referee are required.

Miss Jaine H. McIlroy has been appointed whole-time oculist to the School Board of Glasgow.

* * * *

The Clinical Congress of Surgeons.

THE fifth annual meeting of the Congress will be held in London during the week beginning with Monday, the 27th of July next. The headquarters of the Congress will be at the Hotel Cecil, Strand, W.C. The evening of July 31st will be devoted to the discussion of eye subjects under the chairmanship of Mr. Walter H. Jessop. The following communications will be read :

1. Lt.-Col. R. H. Elliot : The Sclero-Corneal Trephining Operation for Glaucoma. Discussion by Mr. E. Treacher Collins.

2. Mr. F. Richardson Cross ; Operative Procedures for Strabismus. Discussion by Mr. N. Bishop Harman.

3. Mr. J. B. Story : The *technique* adopted by various British ophthalmic surgeons in Extraction of Cataract. Discussion by Mr. Holmes Spicer.

According to the rules of the Congress, the addresses in each instance are to be delivered by one who is not resident in the town or city where the Congress meets. The underlying idea, of course, is that resident surgeons have enough on hand with their clinical work, for the demonstration of which the Congress mainly exists.

* * * *

Mr. William Lang.

ON Thursday, June 25th next, under the presidency of Sir Henry Morris, Bart., a complimentary dinner will be given in London to Mr. William Lang on his retirement from the Middlesex Hospital after thirty-three years' service on the honorary staff. Mr. Arnold Lawson (12, Harley Street, W) will be pleased to give any needed information.

* * * *

International Congress of Ophthalmology.

As readers already know, the XIIth International Congress of Ophthalmology will be held at St. Petersburg from August 10th to August 15th next. Arrangements are in process of completion whereby members can get from London to St. Petersburg on advantageous terms. Mr. W. H. Jessop (73, Harley Street, W.), who is in charge of the negotiations, will be glad to afford any necessary information, as well as to receive the names of those who intend to be present at the Congress.

THE

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A MONTHLY REVIEW OF CURRENT OPHTHALMOLOGY.

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ORIGINAL COMMUNICATIONS.

PERISCOPIC LENSES.

BY
Archibald Stanley Percival M.B., B.C., M.A., Cantab.
SENIOR SURGEON TO THE EYE INFIRMARY, NEWCASTLE-UPON-TYNE.

It is a well-known fact that hypermetropes who have to wear strong convex glasses are obliged to move their heads in order to see distinctly objects that lie to the right or to the left of them. If they keep their heads fixed, and rotate their eyes behind their glasses, their visual lines traverse peripheral parts of the lenses and the resulting image is consequently blurred. Periscopic lenses are designed to obviate this defect; when they are perfectly periscopic, eccentric vision through them is as distinct as centric, so that the wearer can rotate his eyes behind the glasses without being inconvenienced by seeing lateral objects indistinctly.

Recently much attention has been given to the problem of finding the best form of lens for this purpose by many ophthalmologists and mathematicians *quorum pars parva fui*; but the work of von Rohr and Gullstrand stands out pre-eminently among the rest as having given a satisfactory solution to the problem. Unfortunately, as one surface at least of von Rohr's lenses must be aspherical, their cost is too great to be used by any but the wealthy. We have all lately received advertisements of "Punctal" and "Isokrystar" lenses, etc., with photographs showing the distinct image given by a Punctal lens when vision takes place through its peripheral part as compared with the hopelessly blurred image produced by an ordinary biconvex lens under the same conditions. According to the advertisements one would gather that there is a pressing necessity to order "Punctal" lenses for persons who only require a + 2 D. or a + 3 D. lens for reading. However, we all know that anyone who wears such weak glasses can read quite comfortably any ordinary book without moving his head. Practically these expensive aspherical glasses are only advantageous if the power be strong.

My object in the present paper is to show how menisci can be ground with ordinary spherical surfaces for strengths up to +7 D. or +8 D., which will serve satisfactorily for reading purposes. As said before, von Rohr's aspherical menisci are perfect for higher powers, such as are required by aphakic patients, but even to these some help is given by appropriate spherical menisci, if the cost of the aspherical luxury is prohibitive.

My method of dealing with the problem is as follows.—We will suppose the eye rotates an angle θ (say 25°) from the primary position behind the spectacle lens; it is clear that the incident pencil will traverse an eccentric part of the lens, and on emergence from the lens will form an astigmatic pencil with two focal lines. When the size of the pupil is known, the size and position of the least circle of confusion can be calculated for this emergent pencil for the given lens. It is then a simple matter to find what will be the size of this circle of confusion when it falls upon the macula after refraction through the media of the eye. It is required to construct the lens in such a fashion that the retinal circle of confusion shall not be larger than the sectional area of a macular cone, the radius of which is ·001 mm. It is first necessary to find the position of the first and second focal lines (v' and v'') of the emergent pencil from the spectacle lens.

I must confess that there is an error in my determination of v' and v'' as given in my book, for I omitted to take into account the prismatic effect of the glass when vision takes place through an eccentric portion of it. Further, I then only considered distant vision through my lenses, whereas in this paper I shall consider periscopic reading glasses, the object being distant 300 mm. (11·8 ins.) from the surface of the spectacles. As my object is to find the cheapest menisci that will be satisfactory, I give the curvature of each surface in the forms that require no special tools being made for their production.

There is one interesting fact, which has been noted I find by several workers on the subject, that if there is any real solution of the problem by the use of a meniscus with spherical surfaces, there are always two possible forms, either a deep meniscus or a shallow meniscus. For instance, a periscopic meniscus lens of + 6 D can be formed in two ways—a shallow meniscus with its anterior surface convex with a curvature corresponding to + 11 D and its posterior curvature of − 5 D, or a deep meniscus with anterior surface + 17 D. and its posterior surface − 11 D. When placed in the proper position before the eye, either of these glasses will allow it to rotate 25° on either side of the middle line and still have distinct vision; *i.e.*, the circle of confusion will be smaller than the sectional area of a macular cone, although a meniscus of an intermediate value (say, + 14 and − 8) will be very bad for indirect vision, as the circle of confusion will be far too large. This will account for the many different values that are assigned to the correct form of meniscus. Obviously, the shallow menisci are the most convenient on account of (1) their better appearance, (2) their cheapness as they are easier to make, and (3) because there is less displacement of their cardinal points (see p. 394).

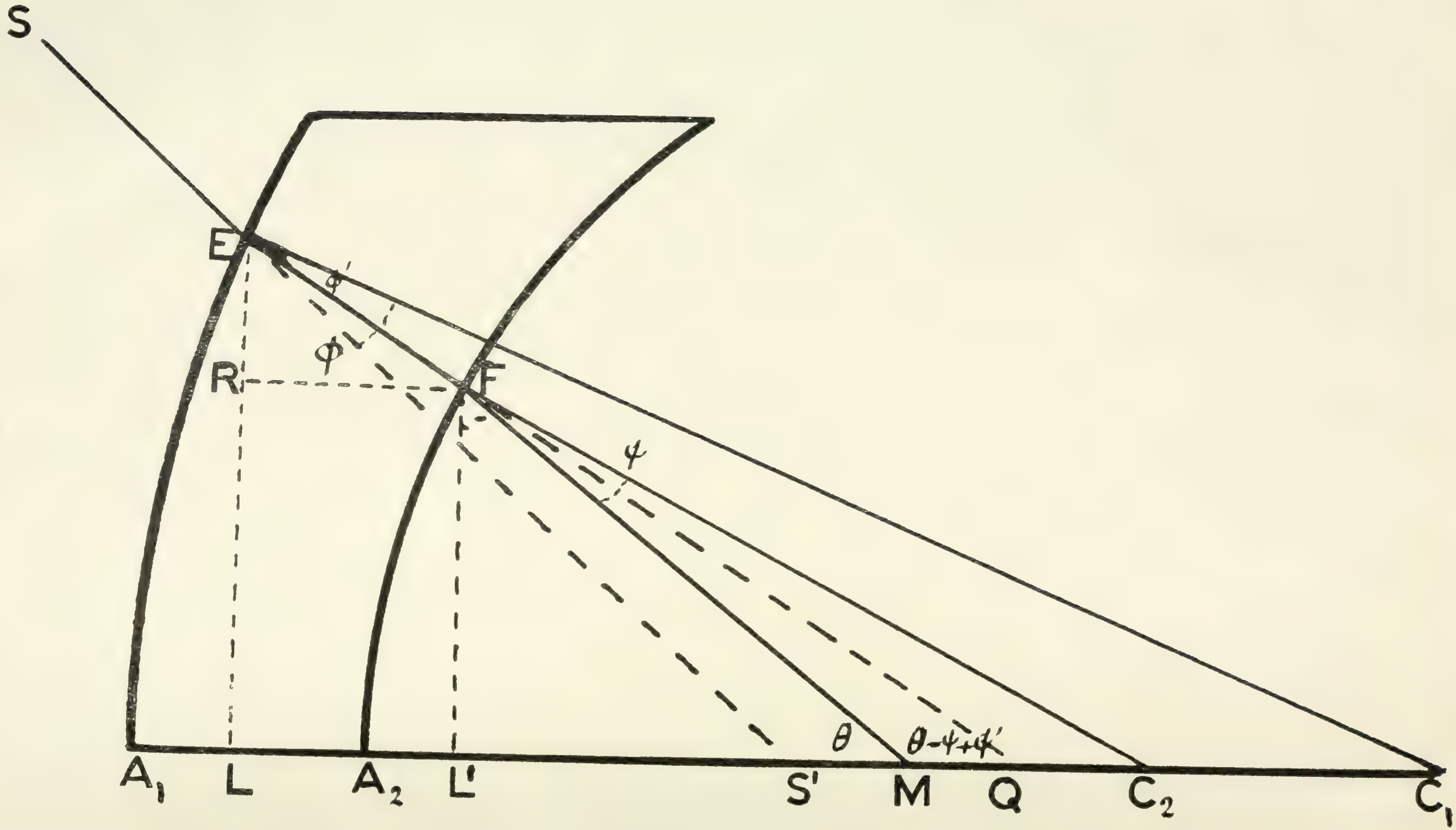
A thoroughly satisfactory solution of the problem can be obtained with a simple meniscus ground with ordinary spherical surfaces for many powers, say from — 20D to + 7D, but it will be found that the meniscus must be of a different form if required for distant vision or if required for reading distance.

For instance if a + 6D lens were required to be periscopic for distance its form should be + 13D — 7D, but as stated above if required for reading distance it should be a less deep meniscus + 11D — 5D. The periscopic reading glass will only be periscopic for distance in the lower powers.

The mathematical process by which the necessary formulæ are obtained is fairly simple geometry, as will be seen from the adjoined diagram. $A_1 A_2 C_2 C_1$, represents the optical axis of the meniscus, the specified points (A_1 and A_2) indicating the positions of the anterior and posterior surfaces of the meniscus, while C_1 and C_2 represent the centres of curvatures of these surfaces. The point M indicates the centre of rotation of the eye which is about 13.4 mm. behind the cornea. The distance A_2M is taken to be 27 mm. the usual distance of a spectacle lens from M. It may be here noted that if a periscopic lens calculated for this distance be used at a greater or less distance from the eye, its periscopic value is lost at once, so that much care is required by the optician in fitting these glasses.

A pencil of light from an object in the line SE will on entering the meniscus be refracted as EF, and on emergence will pursue the course FM, so that the eye behind the lens must rotate through the angle θ in order to see an object in the direction S′ES.

The thickness of the lens A_1A_2 or t varies, of course, with the power of the lens, but t is always known; we know also A_2M or k (27 mm.) and the refractive index of the glass ($\mu = 1·52$). We wish to find expressions for ϕ and


S
E
R
F
φ'
φ
ψ
θ
θ-ψ+ψ'
A₁
L
A₂
L'
S'
M
Q
C₂
C₁

ψ in terms of these known quantities, and of r_1 and r_2 or C_1E and $C\,F$; we shall also require to find the length of the path EF. From the figure we see that:

$$C_1ES' = \phi \qquad C_2FQ = \psi' \qquad A_2MF = \theta \qquad MQF = \theta - \psi + \psi'$$

$$C_1EQ = \phi' \qquad C_2FM = \psi \qquad MC_2F = \theta - \psi \qquad QC_1E = \theta - \psi + \psi' - \phi'$$

The following geometrical relations can be established on inspection. (We are considering the magnitudes as simple geometrical quantities without any vectorial sense of direction).

$$(1) \qquad \frac{\sin\psi}{\sin\theta} = \frac{MC_2}{C_2F} = \frac{r - k}{r_2} \quad \therefore \quad \sin\psi = \frac{r_2 - k}{r_2}\sin\theta$$

$$(2) \qquad \frac{QC_1}{C_1E} = \frac{\sin\phi'}{\sin(\theta - \psi + \psi')} \quad \text{and} \quad \frac{QC_2}{C_2F} = \frac{\sin\psi'}{\sin(\theta - \psi + \psi')}$$

Hence, by subtraction :—

$$r_1\sin\phi' - r_2\sin\psi' = (QC_1 - QC_2)\sin(\theta - \psi + \psi')$$

or

$$r_1\sin\phi' = r_2\sin\psi' + (r_1 - t - r_2)\sin(\theta - \psi + \psi')$$

$$(3) \qquad RE = LE - L'F$$

$$\text{or } FE\sin(\theta - \psi + \psi') = r_1\sin(\theta - \psi + \psi' - \phi') - r_2\sin(\theta - \psi).$$

On now introducing the ordinary conventions of direction :—that counter-clockwise rotations and left to right directions are positive, we notice that all the angles, and r_1, r_2 and FE also, are measured in the negative direction in the diagram. We have consequently only to reverse the signs of t and k, and the given equations will express the relations when all the magnitudes are measured in the positive directions. As EF is required we must make the necessary alteration in (3).

We have then for our general equations

$$(a) \qquad \sin\psi = \frac{r_2 + k}{r_2}\sin\theta$$

$$(b) \qquad \sin\phi' = \frac{r_2\sin\psi' + (r_1 + t - r_2)\sin(\theta - \psi + \psi')}{r_1}$$

$$(c) \qquad EF = \frac{r_2\sin(\theta - \psi) - r_1\sin(\theta - \psi + \psi' - \phi')}{\sin(\theta - \psi + \psi')}$$

Having found by (a) and (b) the values of ψ and ϕ', we can find the distances (v and v_2) from E of the first and second focal lines due to refraction at the first surface by the well-known formula

$$\frac{\mu\cos^2\phi'}{v'} - \frac{\cos^2\phi}{u} = \frac{\mu}{v'} - \frac{1}{u} = \frac{\sin(\phi - \phi')}{r_1\sin\phi'}$$

where u is the distance of the object, which I have assumed to be 300 mm. (reading distance). Now for refraction at the second surface the position of the first focal line v' depends upon the position of the first focal line due to the first surface. In fact we have its distance from F, or $u_1 = v_1 + EF$; similarly for the distance of the second focal line $u = v_2 + EF$.

We then apply the formula again to determine the distances from F (v_1 and v) of the focal lines due to the total refraction at both surfaces of the lens. Remembering that now the refraction takes place from the dense to the rare medium we write

$$\frac{\cos^2\psi}{\mu v'} - \frac{\cos^2\psi'}{u_1} = \frac{1}{\mu v''} - \frac{1}{u} = \frac{(\sin\psi' - \psi)}{r_2\sin\psi}$$

Knowing now v' and v'', we can determine the size of the retinal confusion circle from the formula

$$r = \frac{F' R (v' - v'')}{2v' v'' + F' (v' + v'')}$$

where R is the radius of the equivalent pupil supposed to be in the first principal plane of the eye, and where F′ denotes the first principal focal distance of the eye. The proof of this formula and the method of determining R (the equivalent pupil) may be found in my "Prescribing of Spectacles," pp. 135-7.

As an illustration we will rapidly review the case of a +6 D lens formed of a meniscus having an anterior convexity of + 11 D and a posterior concavity of − 5 D, *i.e.*, $r_1 = -47\frac{3}{11}$ mm. and $r_2 = -104$ mm. We know that such a lens must have an axial thickness of 3·25 mm., so $t = 3{\cdot}25$; we will further consider the eye to move 25° on either side of the middle line, so $\theta = -25°$. The radius R of the equivalent pupil for this hypermetrope we will take as 1·76 mm., and $k = 27$ mm.

Now by (a) $\sin\psi = \frac{r_2 + k}{r_2} \sin\theta = \frac{-104 + 27}{-104} \sin(-25°)$

$\therefore \psi = -18° \ 14'{\cdot}0454, \quad \psi' = -11° \ 52'{\cdot}7744$

From (b) we get $\phi' = -2° \ 42'{\cdot}3667, \quad \phi = -4° \ 6'{\cdot}9180.$

From the focal line formula we find $v_1 = -196{\cdot}8953$ and $v_2 = -197{\cdot}7759$, and from (c) we find $EF = 2{\cdot}2811$. Consequently on adding this value of E F to v_1 and v_2, we obtain $u_1 = -194{\cdot}6142$, and $u_2 = -195{\cdot}4948$.

On applying the focal line formula for the refraction at the second surface we get $v' = -390{\cdot}5730$ and $v'' = -383{\cdot}8084$.

Hence we find the radius (r) of the retinal confusion circle to be ·0006429 mm. which is considerably less than ·001 the radius of the cross section of a macular cone.

Such a lens is therefore quite satisfactory as a perioscopic lens for a distance of 300 mm. If, however, the same lens be used for viewing distant objects, the value of r is found to be ·00235, so that this meniscus is not periscopic for distance.

There are now some details to consider about the position of the cardinal points of this meniscus (+ 11 D − 5 D), 3·25 mm. thick.

(1) Owing to its thickness its focal length is 163·4628 mm. instead of 166·6 mm. so that it is really a + 6·1176 D lens.

(2) The first principal plane of the glass lies 1·747 mm. in front of its anterior surface, while the second principal plane lies 3·844 mm. in front of its posterior surface. We have, however, taken the posterior surface of the meniscus to be in the first focal plane of the eye. This position F′ (13·75 mm. in front of the cornea) is the normal position for a spectacle lens. Whenever a concave glass is used at a greater distance than this, its power is virtually diminished, and the retinal images become smaller. When a hypermetrope places his correcting glass at a greater distance from his eye than the normal, and when he is viewing distant objects through it, the power of the glass is virtually increased. When used for near work the power of the lens is virtually diminished unless his hypermetropia be high.

If p denote the distance PF' of the first focal plane of the eye from the punctum remotum of the hypermetrope, and if w denote the distance of F' from the work, and if d denote the distance the glass is removed from F' its normal position, the effective power of the lens is increased or diminished according as $p + w - d$ is positive or negative.

Now p is always negative in hypermetropia, $\therefore$ for distant vision when $w = \infty$, $p + w - d$ is positive, and the virtual power of the lens is increased.

If p is numerically greater than $w - d$, the expression is negative and increasing the distance of the lens virtually lessens its power although the retinal image becomes greater.

In the case of the presbyope for whom the above meniscus would be the appropriate correction, $p = -362$ mm. $w = 300$ and $d = 3{\cdot}844$, consequently the effect of removing the glass the distance d, will be to lessen its power slightly. In fact the + 6·1176 D lens will have the same effect as a + 6·09 D thin lens if it were placed at F'.

It is well to remember that with a convex meniscus the principal points are in front of the lens, and that with a concave meniscus they are on the ocular side of the lens. Consequently a slightly weaker meniscus (whether concave or convex) will be required for correcting the error of refraction than if the correcting glass were a bi-lens, except when a periscopic convex glass (say under +8 D) is required by a hypermetope for reading, in which case a very slightly stronger meniscus will be required. In practice, however, this displacement of the cardinal points may be neglected, as it entails so very little difference in the strength of glass required unless very high powers are used. It is most important to remember that no attempt must be made to compensate for this displacement by altering the position of the glasses, as a very slight alteration of their distance from the eyes will destroy their periscopic effect.

In conclusion I will give the results of a few of my calculations for periscopic lenses which are based on Tscherning's latest values for the optical constants. These I have found to be more in accord with my findings for English eyes than Gullstrand's values.

	$u = 300$ mm.	$u = \infty$
+ 3 D	+ 8 − 5	+ 9 − 6
+ 6 D	+11 − 5	+13 − 7
+ 8 D	+13·5 − 5·5	+15 − 7 (r = ·0010952)
+12 D	(+17 − 5)	(+17·5 − 5·5)

The menisci of +3 D and +6 D are quite satisfactory for a range of movement of 25° on either side of the middle line; the +8D though satisfactory when used for a distance of 300 mm., fails to be perfectly periscopic when used for distance. The note shows that when $u = \infty$, $r = {\cdot}0010952$ mm. Convex lenses above +8 D cannot be made with spherical surfaces to be periscopic for an angle of 25°. However, a total range of 50° is very rarely required, for instance, the length of the lines in this paper is abnormally long, being 122 mm., yet in reading it at a distance of 327 mm. from the centre of rotation of the eye, the range of rotation on either side of the middle line need not exceed 11°. For $\frac{61}{327}$ is less than tan. 11°. With regard to the meniscus of +12D, I frankly confess that it does not allow a range of movement of even 11° on either side, and yet it will enable an ordinary book to be read without turning the head. If the patient wants a more periscopic glass than this, he must indulge in the expense of von Rohr's beautiful aspherical lenses.

DIPLOPIA-POLYOPIA IN CONNECTION WITH ASTIGMATISM.

BY

J. W. BARRETT, C.M.G., M.D., M.S., F.R.C.S.Eng.

LECTURER ON THE PHYSIOLOGY OF THE SPECIAL SENSES, MELBOURNE UNIVERSITY; CONSULTING OCULIST TO THE VICTORIAN EYE AND EAR HOSPITAL; OPHTHALMOLOGIST TO THE MELBOURNE HOSPITAL.

THE fact that those who are astigmatic frequently see double is well known to all who fit patients with spectacles. Astigmatic patients frequently see a duplicate of the line they are looking at above or below it. When fully corrected, the diplopia disappears.

The attention of the writer was long ago directed to this singular appearance, which apparently differs from the monocular diplopia referred to by Donders, Helmholtz, Tscherning, and others. The principal references to it are by Bull, who described the visual effects of refractive error in the Ophthalmological Societys' *Transactions* of 1896, and Verhoeff, who made similar references in a paper published in the *Archives of Ophthalmology* in 1900.

During a recent visit to England, after discussion with Dr. Parsons, I found that Professor Worthington was dealing with the subject from the point of view of the physicist and discussed the matter very fully with him. He has brought the matter before the Ophthalmological Section of the Royal Society of Medicine, and dealt with it, I understand, from the point of view of the physicist. In the present paper I propose simply to state the facts as they are known to me from the ophthalmological point of view.

Mr. Grayson, of the Melbourne University, whose work on the ruling of gratings is well known, kindly prepared for me a set of beautifully and accurately executed types corresponding in the letter "O" from 6/60 to 6/2 in twelve gradations, and in the letter "T" from 6/60 to 6/1 in thirteen gradations. I selected these letters because they show the doubling best.

Drs. Mathison, Jona, and Lynch at various times assisted me in making a number of subjective and objective examinations of the phenomena, and of these the following are typical examples.—If the types are well illuminated and placed at a distance of 1·5 metres, and a cylinder of +1·5D. is placed before my right eye, which is approximately emmetropic, the appearances may be thus summarised. In order to make the matter more intelligible, I have referred to the letters as 6/60, 6/36, and so on, meaning the letters corresponding to the type used by Snellen visible to the normal eye at distances of 60 metres, 36 metres, and so on. With the axis of the cylinder horizontal, *i.e.*, 180 degrees, the letters "O" 6/60, 6/36, and 6/24 show blurring above and below. The letter 6/18 suggests doubling, the letters 6/12 and 6/9 are doubled, the letters 6/6, 6/5·5 and 6/4 are well doubled, the letter 6/3 is trebled, and the letter 6/2 is still further multiplied. All these letters are multiplied in the vertical direction.

When the axis of the cylinder is vertical (90 degrees), the result is as follows.—There is a suggestion of lateral doubling in the letter 6/18. The letters 6/9 and 6/6 are doubled, and the smaller letters appear as multiple images.

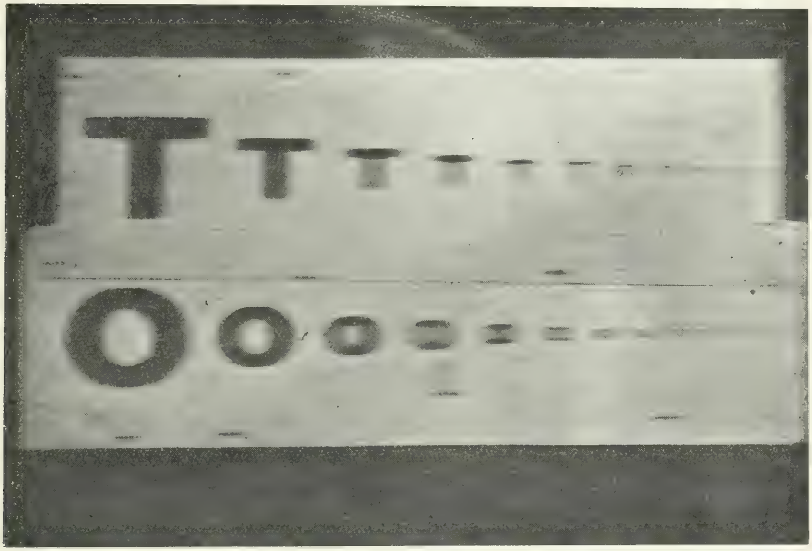
With the letter "T" and the cylinder horizontal (180 degrees), the letter 6/18 shows a suggestion of doubling in the cross of the "T"; the doubling becomes definite in the letter 6/12; in the letter 6/6 the cross bar shows signs of trebling. With the remaining letters the appearances are vague.

Examining the letter "T" with the axis of the cylinder vertical (90 degrees), the letter 6/12 shows signs of the vertical bar doubling. The smaller letter shows multiple vertical bars. The ends of the cross are blurred throughout.

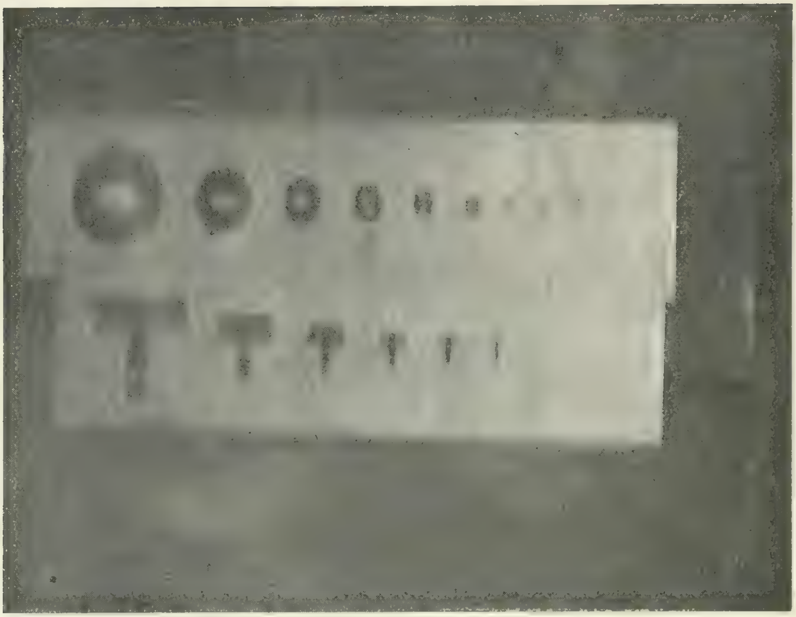
It was found that this doubling, or polyopia, could be produced in this way with lenses of varying strength and size, but the best results were obtained by lenses of 1D. to 3D.

It is very difficult, if not impossible, to double the large letters with any cylinder at any distance. I have not however been able, in spite of much trouble, to obtain a simple expression for the relationship of size of letter, distance of observer, and strength of lens.

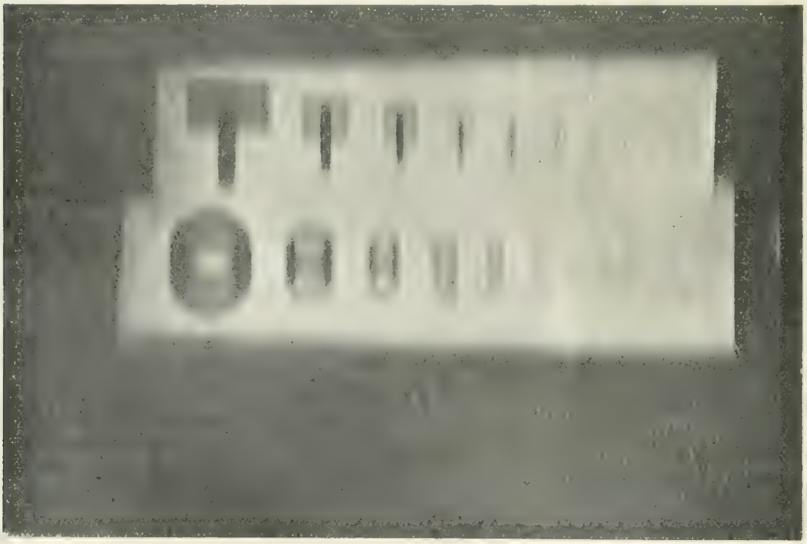
With my right eye, doubling produced by a weak lens can be destroyed by interposing a pin-hole diaphragm. but it is restored even with the diaphragm unaltered by gradually increasing the strength of the lens. With my right eye a point of light or a fine black point on a white paper cannot be doubled with any device, but an "O" or a "T" is at once doubled by the use of the cylinder. This is really the crux of the problem.—Why should a point when so viewed show simply irregular elongation, whereas certain formed letters are doubled or multiplied. At first it was inferred that the doubling was inferential and psychical, and two methods were employed to determine this point. Unknown geometrical figures were submitted to an observer watching with an eye made artificially astigmatic with a cylinder. Doubling was immediately produced. We then determined to employ a camera made artificially astigmatic. The types were illuminated by electric light and placed about a metre from the objective of the camera. The objective of the camera had a comparatively short focal distance, say 9 to 10 centimetres, and a cylinder of +1.5D. with a thickness of about 4 centimetres was placed in front or behind the objective. By this means the doubling or trebling was photographed, and although the results are not as definite as those seen subjectively, they are sufficiently definite to show that they are produced by purely objective means. The best doubling was effected when the focussing place was in front or behind the place of least diffusion, but in these two positions the doubling was effected at right angles to one another.



Photograph taken with a camera with a sphero-cylindrical objective.



Photograph taken with a camera with a sphero-cylindrical objective.



Photograph taken with a camera with a sphero-cylindrical objective.

The varied explanations of these simple phenomena resolve themselves into two groups. The doubling may be due to symmetrical variations in the density of the lenses, whether human or artificial. There are many flaws in the human lens, as everyone knows, and as everyone can demonstrate. The nearest approach to symmetrical variations are those which have been demonstrated by Professor Worthington, but even they hardly account for these phenomena. The other explanation is that the changes are due to spherical aberration. I find it very difficult to accept either explanation, because under no circumstances can I make a fine point of light or a fine black dot on a sheet of white paper double itself with my right eye, whereas I can make an "O" or "T" of certain size double, treble, and still further multiply itself in the same conditions. It may be that the illumination in the elongated point or dot is not uniformly distributed, but that the irregularity is difficult to detect.

Addendum.

Since forwarding to THE OPHTHALMOSCOPE a statement of the phenomena referred to in the heading, I have seen Professor Worthington's paper, as published in the *Proceedings of the Royal Society of Medicine*, Vol. VI, No. 9, page 112.

Professor Worthington is kind enough to refer to some work of mine in this paper. It is, however, probably one of the misfortunes of living at so great a distance from Great Britain that the quotation is not quite accurate. Further, the explanation of the phenomena given by Professor Worthington is not, in my judgment, sufficient to account for the facts. I venture, therefore, briefly to draw attention to some essential features of the appearances.

So far as I understand Professor Worthington's most interesting review of the subject, he is satisfied that the aberration associated with a sphero-cylindrical system is sufficient to explain diplopia, and in a special case triplopia. But beyond this the Verhoeff explanation cannot hold good. To account for the multiplication of images of letters up to six times which can be produced in the way described in my previous article, he invokes the aid of obscurations at or near the anterior surface of the lens. He apparently thinks that the combination of the effect of a sphero-cylindrical system with the presence of these obscurations is sufficient to account for the phenomena. He further suggests that the tripling which I showed in a photograph is due to dirt or to scratches on the lenses used. As he rightly observes, it is far easier to see this diplopia subjectively than to demonstrate it objectively. The retina is far more sensitive than any camera, and it is not easy to produce diplopia with a sphero-cylindrical objective in a camera on all occasions, and tripling is rarely produced.

But anyone who possesses an emmetropic eye, and will place himself beside Snellen's test types, and hold before one eye a +1·5 cylindrical lens, will probably find the "O's" and the "T's" on the smaller lines multiplied up to six times or more. He will further find that if he rotates the cylinder round the line of vision, that the line of "O's" or other letters will rotate as he rotates the cylinder. In other words, the "O" has become elongated into a string of "O's" which bear a definite relationship to the axis of the cylinder. If anyone looks through a pin-hole aperture at a white ground, as Professor Worthington suggests, and sketches the obscurations in his own lens, he will find (whatever his age) plenty to draw. These obscurations are, however, rarely, if ever, symmetrically disposed. Although the sectors of the lens can sometimes be made out, the figure usually produced is more or less irregular. In order to test the matter, after reading Professor Worthington's article, I had a +1·5D. cylindrical lens carefully polished. Both Dr. Parnell and I then tested its effect on the smaller types, and obtained the usual result. We then examined the lens with a one inch objective on a Bausch-Lomb microscope, and found that, so far from there being any dirt or any scratches on the lens, it was perfectly clean and transparent. It may be replied that the obscurations were in the human lenses all the time. In that case the rotation of the cylindrical lens in front of the eye could not have produced a row of letters symmetrically disposed which rotated as the cylinder was rotated.

As indicated previously, it is difficult to photograph distinctly beyond the stage of tripling, but I am satisfied that there is no essential difference in the phenomena as revealed by the camera with a sphero-cylindrical objective and those produced by an astigmatic ocular combination. Everything points to some symmetrical irregularities of structure in the lenses used.

I need hardly say that in the very numerous attempts to photograph the doubling and tripling of letters more than ordinary care was taken to see that the lenses used were clean.

Whilst engaged in this matter my colleague, Dr. A. W. Orr, called my attention to a case which had just come under his notice, the notes of which are worth producing:

A. B., a young man, aged 20, consulted him for a refractive error. The preliminary vision was 6/18 partly right, and 6/24 left. He stated that with the left eye there was a doubling of the "E" corresponding to 6/60 of Snellen's types. The image was upwards and to the left at an angle of 45°. There was less marked doubling with the right eye and the image was more directly above and a trifle to the right. With both eyes open, the doubling was scarcely noticed. After dilatation of the pupils the doubling was more noticeable and was slightly to the left above with both eyes open. He stated that his attention had not been directed to this doubling previously. On correcting the refraction, the result was found to be as follows:

$$\text{R.V. c.}\ \frac{-\ {\cdot}5\text{D. sph.}}{-\,2{\cdot}25\text{D. cyl. }175^{\circ}} = \frac{6}{4}$$

$$\text{L.V. c.}\ \frac{-\ {\cdot}5\text{D. sph.}}{-\,1{\cdot}75\text{D. cyl. }145^{\circ}} = \frac{6}{4}$$

Even with the correction, slight doubling was still experienced with the left eye, which, however, disappeared on the use of a diaphragm of 2 mm. diameter.

I have never yet been able to produce doubling of a letter as large as "E" corresponding to 6/60 with any artificial arrangement.

The three plates which accompany this communication are fair samples of photograhs taken with a camera possessing a sphero-cylindrical objective. The results are far inferior to those which can be obtained subjectively.

CLINICAL MEMORANDA.

ABNORMAL COURSE OF A RETINAL VEIN.

BY
GEORGE COATS,
LONDON, ENGLAND.

THE abnormality here described, if not unique, must be of the greatest rarity, no example being known to me in literature, or being mentioned in Leber's recent review of the subject in the Graefe-Saemisch *Handbuch* (II Theil, VII Band, X Kap. S. 48 *et seq.*, 1914).

The patient was a woman, aged 29 years, who came to hospital on account of a refractive error. R. with — 1.5D. sph. ○ + 3.5D. cyl. ax. 45°7=6/12, and J. 1; L. with — 4.5D. sph. ○ — 2.5D. cyl. ax. 45°7=6/24, not further improved. Except for the presence of a small crescent downwards and outwards, the right fundus was normal.

In the left (Fig. 1), the disc forms an oblique oval with its long axis directed from below and inwards to above and outwards. A broad, highly atrophic conus is present on its infero-external aspect. The usual accompaniments of this type of distortion are conspicuous ; the inner-upper part of the disc has a prominent, congested appearance, owing to crowding of the nerve fibres ; this edge is ill-defined ; and the vessels have in general a downward-outward direction of entry, those destined for the upper-inner segment of the fundus having to bend backwards to reach their distribution. A small cilio-retinal vessel emerges with a strong twist from the middle of the crescent.

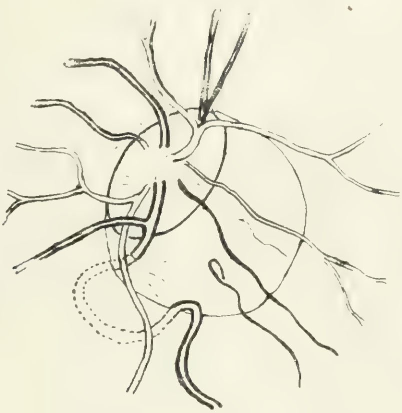


Fig. I.

The abnormal vessel is the main inferior vein. After having given off a considerable nasal branch, and having crossed about half the breadth of the crescent, it suddenly dips into the underlying atrophic tissue, passes, within the choroid, beyond the conus into the region of normal red fundus, and there, veiled but distinctly visible, describes a loop of some size, which brings it back to the edge of the conus below and external to its point of entry. It now turns forwards, hooking as it were, over the edge of the conus, re-enters the retina, and pursues its course as an ordinary retinal vein. Throughout this abnormal path no branches appear to be received—certainly no large branches.

It will be observed that this is neither a cilio-retinal nor an optico-ciliary vein. There is indeed a type of optico-ciliary vessel which is situated, not, as is usually the case, in the depths of the papilla, but superficially, on the same level as the ordinary retinal branches ; at the edge of the disc it gives off branches to the retina, and itself disappears into the choroid (see *e.g.*, Lawford. *Trans. Ophth. Soc.*, XV, p. 195. pl. VIII, fig. 2. 1895 ; Coats, *Ophth. Rev.*, XXX, p. 44. 1911). In the present instance however no connection is formed with any ciliary vessel, and it seems impossible to derive the abnormal vessel from any process of suppression in the branches of a true optico-ciliary vein, or from the enlargement of any normal anastomosis about the nerve head. That the condition is a congenital abnormality and not due to the stretching and atrophy which have taken place at the side of the papilla, scarcely admits of doubt ; yet it is difficult to think of any fact in the normal development of the retinal vascular system which would account for the peculiar course of the vessel.

A congenital condition occasionally observed is an encroachment on the choroid of the neuroglial tissue of the papilla at the edge of the nerve entrance (Fig. 2). This encroaching tissue is evidently epiblastic and formed by a small projection from the secondary optic vesicle. Although it is the deeper layers of the papilla which are here in question, it is perhaps conceivable that an outgrowth of this type might, exceptionally, carry with it into the choroid a loop of one of the larger retinal vessels. Otherwise I know of no physiological variation of structure which can be brought into association with so peculiar an abnormality.

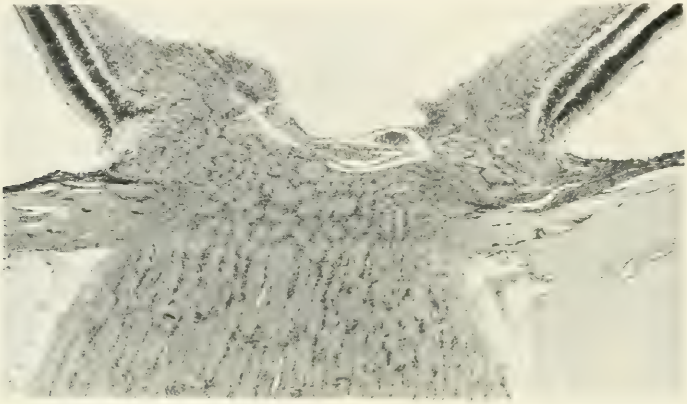


Fig. 2.

× 34. Encroachment on the choroid of the epiblastic tissue of the papilla. The condition is especially well seen on the right-hand side, where the neuroglia burrows for some distance underneath the inner layers of the choroid. The appearance is not to be confused with the expansion of the papilla *in front of* the choroid which occurs in papillœdema. It is suggested that, exceptionally, a loop of a retinal vessel might be carried into the choroid by such an epiblastic outgrowth, but in order to produce the ophthalmoscopic picture here described the encroachment would have to be considerably larger than is shown in this figure. The case was one in which an irritable eye was excised six months after the occurrence of an hypopyon ulcer. T. —. No infiltration or atrophy is present in the nerve.

THE DURATION OF LIFE OF LONDON EYE SURGEONS (1800—1850).

BY

JULIUS HIRSCHBERG, M.D.,

BERLIN, GERMANY.

As the chemist, in his operations, sometimes hits upon an unexpected by-product, so I got, while working for my historical book ("England's Oculists 1800—1850," now in the press), an interesting fact which I venture to place before the British medical profession.

I compile here these gentlemen who worked (1800—1850) independently in eye surgery or were appointed (1805 till 1850) as surgeons to one of the London Eye Hospitals or Eye Departments of General Hospitals, and consider their duration of life.

NAMES.	Duration of Life (years).		
	Long (over 60).	Middle (40-60).	Short (under 40)
1. James Wardrop, 1782—1869	87	—	—
2. John Vetch, 1783—1835	—	52	—
3. William Adams, 1783—1829	—	44	—
4. John Stevenson, 1778—1846 (?)	69	—	—
5. John C. Saunders, 1773—1810	—	—	37
6. John Richard Farre, Physician, 1774—1862	88	—	—
7. Frederick John Farre, Physician, 1804—1886	82	—	—
8. Benjamin Travers, 1783—1856	73	—	—
9. William Lawrence, 1783—1867	84	—	—
10. Frederick Tyrrel, 1797—1843	—	46	—
11. John Scott, 1798—1846 . .	—	48	—
12. John Dalrymple, 1804—1852 ...	—	48	—
13. James Dixon, 1814—1896	82	—	—
14. George Crichett, 1817—1882 ...	65	—	—
15. William Bowman, 1816—1892	76	—	—
16. G. T. Guthrie, 1785—1856	71	—	—
17. Charles Gardiner Guthrie, 1817—1859 ...	—	42	—
18. A. S. Smee, 1818—1878	—	60	—
19. H. Haynes Walton	could not be ascertained by myself.		
20. John Morgan			
21. J. F. France			

Thus we have among eighteen surgeon-oculists, ten with long life, seven with middle life, and only one with short life, alas! a very genial man.

Naturally, every one who knows a little about British manners and customs, must be inclined to attribute this very happy result to the country house life and outdoor exercises which prevail in Great Britain.

Then we must make comparison with Paris, where this kind of life probably was not so customary in the time of 1800—1850.

So I proceed to give the corresponding list of Paris, according to my book, "French Oculists," 1800—1850.

	NAMES.	Duration of Life (years).		
		Long	Middle.	Short.
1.	Alexis Boyer, 1757—1833	76	—	—
2.	Joseph Philibert Roux, 1780—1854 ...	74	—	—
3.	Guillaume Dupuytren, 1778—1835 ...	—	57	—
4.	Antoine Demours, 1762—1835	73	—	—
5.	Sebastian Guillié, 1780—1865	85	—	—
6.	Jules Sichel, 1802—1868	66	—	—
7.	Ch. J. Carron du Villards, 1800—1860 ... (lived abroad)	--	60	—
8.	Francesco Rognetta, 1800—1857... ...	—	57	—
9.	August Bérard, 1802—1846	—	—	44
10.	Fr. L. Tavignot, 1818—?	—	—	—
11.	Louis Joseph Sanson, 1790—1841 ...	—	51	—
12.	Paul Louis Caffe, 1803—1876	83	—	
13.	Pierre Alex. Magne, 1818—1887... ...	69	—	—
14.	Jules Germain Cloquet, 1790—1883 ...	93	—	—
15.	Charles Marie Edouard Chassaignat, 1805—1879	74	---	—
16.	Alfred Armand Louis Marie Velpeau, 1795—1867	72	—	—
17.	Joseph François Malgaigne, 1806—1865 ...	-	59	—
18.	Auguste Theodore Vidal, 1803—1856 ...	-	53	—
19.	Stanislas Laugier, 1799—1872	73	—	
20.	Pierre Nicolas Gerdy, 1787—1856 ...	69	—	...

We have in Paris nineteen gentlemen, twelve with long life, six with middle life, and one with short life: about the same happy result as in London.

The eye-surgeon's life seems to be full of resignation, but was in that time of long duration.

A CASE OF TRAUMATIC EXOPHTHALMOS.

BY

Philip A. Harry, M.D.,
Rochdale, England.

H. B., a labourer, aged 47, was brought by a friend of his at 9.15 p.m. on the 2nd of May, with the history that he had injured his right eye. About an hour before, he was on his way home, when he fell into a hedge. On getting up he made no complaint, and if his friend had not noticed that his eye was bleeding, he might have continued his journey home.

Inspection showed that the right eye was bulging 3 or 4 mm. more than the left; there was no pulsation. The moderately dilated pupil did not react to light, and there was no consensual reaction. Tension low. The lower lid was swollen and bruised, the skin was abraded over an area of about 4 mm. by 6 mm.; there was no evidence of a punctured wound. He was unable to close his right eye completely; on making the attempt, it was noticed that the conjunctiva was chemosed. A constant trickle of blood escaped from the inner canthus, but the congested condition of the bulbar conjunctiva made it very difficult to see where the blood came from.

On raising the upper lid to explore the conjunctival sac for a possible foreign body, it was noticed that the eyeball fell forwards as though it lacked the proper attachments to the orbit, and whereas his left eye was turned strongly upwards, the right eye continued to look straight forwards or slightly outwards; there was no spasmodic contraction of the orbicularis palpebrarum.

Further investigation showed that a wide separation of both eyelids caused the eye to come forwards on to his cheek. It was seen that the conjunctiva was torn, in a ragged manner, a short distance from the limbus. The only muscles that remained attached to the eyeball were the external rectus and the inferior oblique, and the attachment of the latter was very slender. Rotation of the eye outwards made it evident that the optic nerve was also torn across, close to the globe. The nerve had retracted in its sheath, a bead of vitreous was escaping from the position of the ruptured nerve head.

The eyeball and lids were carefully cleaned, and the organ was entirely removed. With the exception of a slight corneal abrasion, there was no injury to the anterior part of the eye.

The patient was considerably under the influence of alcohol and needed no other anæsthetic while the excision was being performed. Indeed, the whole procedure seemed to afford him great amusement.

Section of the globe showed that it was perfectly normal. There was no dislocation of the lens and no retinal detachment. There was no trace of intraocular hæmorrhage. The optic nerve had obviously been torn out at the disc; the lamina cribrosa was absent, in its place was a hole about 0·5 mm. in diameter through which vitreous escaped.

The socket healed as quickly as in the case of an ordinary enucleation. The lids, however, remained œdematous for several days, and there was some ecchymosis of the cheek.

The following are some similar cases, mentioned in previous numbers of THE OPHTHALMOSCOPE:

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A. E. Turnbull.—Evulsion of the eyeball during instrumental delivery. *British Medical Journal*, November 27th, 1907.

Donaldson.—Avulsion of the eyeball during instrumental delivery. *British Medical Journal*, January 28th, 1910.

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Wolff.—Injuries of the child during labour. *The Ophthalmoscope*, February, 1908. (Collected cases, 19 of avulsion of the globe and 13 of traumatic exophthalmos.)

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Galloway.—Luxation of the eyeball. *The Ophthalmoscope*, April, 1910.

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Dislocation of the eyeball (three cases). *Ophthalmic Review*, Vol. XVIII.

A CASE OF TUBERCULAR IODISM SIMULATING GUMMA OF THE EYELID.

BY

SYDNEY STEPHENSON,

LONDON, ENGLAND.

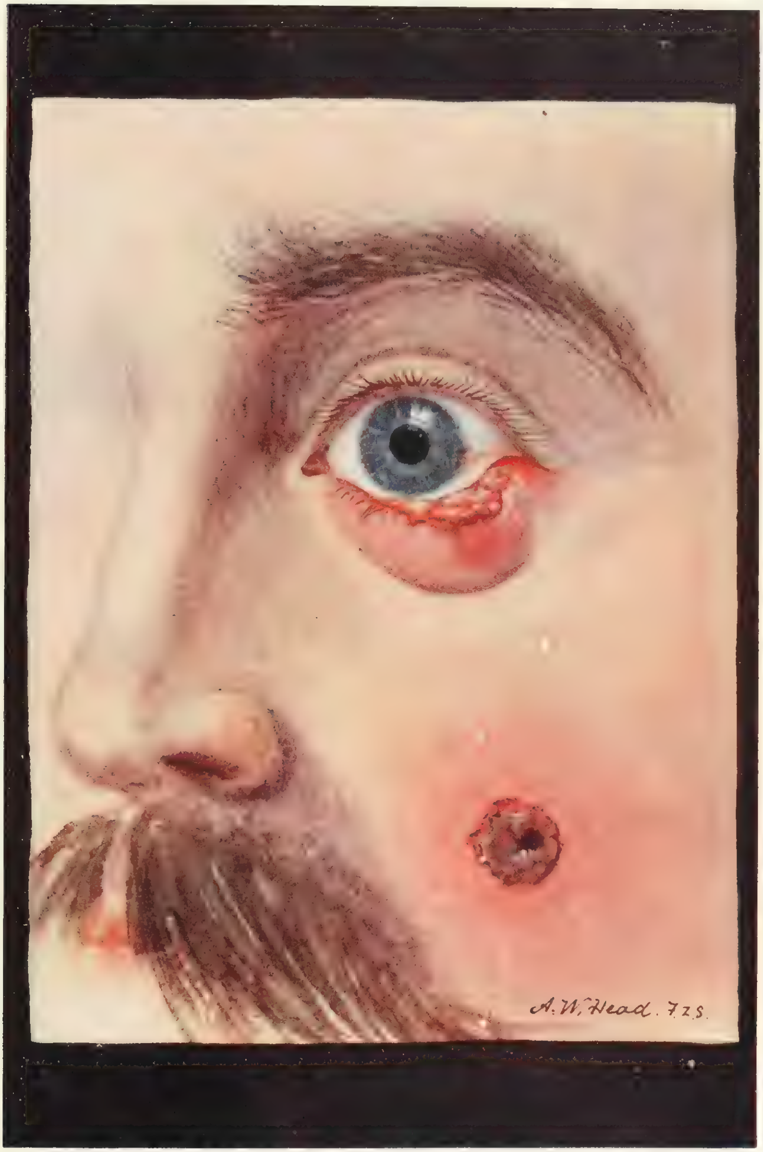
GEORGE W., aged 30 years, attended my out-patients at the Kensington General Hospital for the first time on December 4th, 1907.

The following **history** was given by the patient.—Gonorrhœa in November, 1906, lasting until March, 1907, that is to say, longer than any other gonorrhœa from which the patient has suffered. Towards the middle of March, 1907, a spot came out on the right knee, and was followed by others on the forehead, right forearm, left upper arm, and towards the end of that month, by "sores" upon the legs. In June or July last the patient's throat became ulcerated.

On August 14th the patient consulted Dr. David Walsh at the Kensington General Hospital. A diagnosis was made of tertiary syphilis. The notes which follow were transcribed from the patient's case-sheet:—"No sore throat or headaches. Primary sore last Easter. Treated with mercury since. Large crusted serpiginous syphilide on left thigh. Others have left pigmented superficial scars."

When I saw the patient on December 4th, 1907, his **condition** was as under:

The outer half of the left lower eyelid is red and swollen but not tender. At first sight, the appearances reminded one of an abscess in the substance of the eyelid. On palpation, however, it was obvious that the tissues of the lid were infiltrated, and the condition recalled a gummatous process. Another infiltrated area was present in the substance of the left cheek, one inch or so above the upper lip. Below the left jaw was a carbuncular looking mass, discharging pus by several fistulæ. The right ear showed a scaly eruption, not unlike eczema. On the back of the scalp, situated over the occipital bone, was a crusted sore. A number of pigmented, supple, superficial cicatrices, possibly the remains of cutaneous gummata, present over right knee, both legs, left thigh, left buttock, and right forearm.



A CASE OF TUBERCULAR IODISM SIMULATING GUMMA OF THE EYELID.

SYDNEY STEPHENSON.

To face p. 406

The infiltrated lesions of the lower lid, cheek, etc., closely resembled gummata, but on reading Dr. Walsh's further notes, it became quite clear that they represented that rare form of iodism known as "tubercular iodism."

Dr. Walsh's notes ran as follows.—The patient was treated locally with ammoniated mercury ointment and internally with potassium iodide (grs. 10) and citrate of iron and ammonia (grs. 10) thrice a day. His attendances at the Hospital were somewhat irregular, having been registered upon the following dates: August 28th, September 25th, October 19th, and November 16th. On the last-named date the potassium iodide was discontinued owing to the existence of "well-marked iodide papules face, etc."

The patient stated that a small swelling, an "iodic papule," had existed towards the centre of the left lower eyelid for about a fortnight, and that the swelling had become greater during the three days before he consulted me.

Progress and Treatment.

Boric lotion and oleate of mercury (10 per cent.) were prescribed to be applied to the affected lid.

December 11th, 1907.—The left lower eyelid is now tender, and the disease process has extended to the whole of that structure. There is definite ulceration of the upper aspect of the outer end of the swollen lid.

December 14th, 1907. The outer half of the left lower lid is now ulcerated, and the rest of the lid is infiltrated. The parts are tender. The likeness to a gumma becomes more and more pronounced. Sajodin, one gramme twice a day, administered internally, and the ulcerated surface to be treated with iodoform.

December 18th, 1907.—Condition, as shown in the coloured sketch, has improved. The left lower lid is occupied by a reddish swelling, more marked in the outer half than elsewhere, and the parts are slightly tender. A shallow ulcer, with clean-cut non-indurated edges and nodular floor, occupies the upper part of the outer half of the affected eyelid. It measures 3 cm. by 1 cm. The other sores, one on the left cheek and the other below the left side of the chin, are also in process of healing.

December 28th, 1907.—The ulceration of the left lower lid has now almost healed, and the infiltration of the parts is much less marked. The other lesions are also doing well.

January 15th, 1908.—The ulceration of the lower lid has healed. But there still remains some reddening and thickening of the outer half or two-thirds, with a few scales of desquamating skin at the lower part of the thickened area.

Remarks.

Of the various skin lesions that may on occasion follow the internal adminstration of potassium iodide, that described in the present communication is probably the rarest. At one stage the resemblance to gumma was most misleading. I was not surprised accordingly to find the following remarks made upon the subject in the fourth edition of Dr. Norman Walker's "Introduction to Dermatology" (p. 69).

"In rare cases the lesions produced are at first solid, and later break down in a manner so similar to the gumma, that one or two patients have been dosed into their graves by the pushing of the very drug which was the original cause of their trouble. In others, large solid tumours have developed, leading to the mistaken diagnosis of malignant disease or even leprosy."

In reference to the present case a couple of points appear to be worthy of notice.—First, that the potassium iodide had been discontinued eighteen days before the patient was first seen by me; and, secondly, that the several lesions healed under the administration of another iodine compound, namely, sajodin.

NOVELTIES.

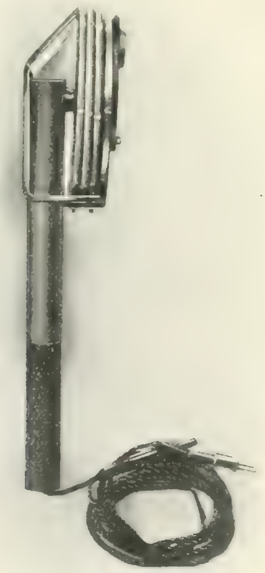
ILLUMINATED SCOTOMETER CAPABLE OF BEING USED FOR RAILWAY COLOUR TEST.

BY

JOHN PEARSON, M.B., C.M.,

ASSISTANT SURGEON, OPHTHALMIC INSTITUTION, GLASGOW ROYAL INFIRMARY.

THE following is a brief description of an instrument I have designed and which I have found useful both as a scotometer and for testing colour vision. It is an improved model of the instrument I showed last October at the meeting of the Scottish Ophthalmological Club at Paisley Eye Infirmary. One of its advantages is its portability, for it can be carried in the coat pocket. The accompanying illustration gives a general idea of the instrument. It consists of four circular superimposed discs, each having a number of apertures. Two of these discs are each fitted with glasses of the following colours:—violet, minus red, signal green, orange, red, and white. This duplicating allows of the mixing of these colours.



A third disc is fitted with neutrals of various shades and with ground and corrugated glass after the manner of Edridge Green's colour lantern, to represent atmospheric conditions. The fourth disc has diaphragms varying in size from 0·5 mm. to 13 mm. The illuminant is a small electric incandescent lamp fitted in the handle, the light from which is reflected by means of a mirror, so as to pass through the uppermost opening. A + 10 D. Sph. lens in front of this renders these rays approximately parallel. By means of letters engraved on the discs the required colours and neutrals are easily placed in position and retained accurately by spring clips. Those possessing a battery-in-handle electric ophthalmoscope can readily adapt the battery and lamp to this instrument, which has been made for me by Mr. John Trotter, 40, Gordon Street, Glasgow.

CURRENT LITERATURE.

NOTE.—Communications of which the titles only are given either contain nothing new or else do not lend themselves to abstract.

I.—PAPILLŒDEMA AND INTRACRANIAL DISEASE.

Hippel, E. von.—On the significance of papillœdema in the diagnosis of intracranial disease, and on the treatment of the condition. (Ueber die Bedeutung der Stauungspapille für die Gehirndiagnostik, und über ihre Therapie.) *Centralblatt für die Gesamte Ophthalmologie und ihre Grenzgebiete*, Bd. I, Heft i, Februar, 1914.

This paper, by **v. Hippel**, of Halle, is a *résumé* of important facts relating to the condition of papillœdema. The writer prefaces his remarks by the statement that papillœdema associated with intracranial disease is undoubtedly, in the great majority of cases, an indication of raised intracranial pressure, although the method by which the raised pressure acts is still a matter of dispute. Papillœdema is, then, of great diagnostic importance, especially in the earlier stages, in which it is most essential to distinguish papillœdema from optic neuritis.

Uhthoff regards a swelling under two dioptres in height as more likely to be a neuritis than a mechanical œdema, but von Hippel thinks this distinction open to criticism. He points out that there must be an early stage in all cases of papillœdema, in which the swelling is under two dioptres, and this is the very time when, as already indicated, it is most important to make a correct diagnosis.

In order to arrive at a diagnosis, attention must be paid to fine details of ophthalmoscopic appearance, to general symptoms, and, lastly, to the clinical course of the case.

As regards ophthalmoscopic appearance, Schieck believes the earliest phenomenon in papillœdema to be a blurring of the centre of the papilla where the large vessels emerge, while Horsley, on the other hand, maintains that the swelling always begins in the upper nasal quadrant. von Hippel agrees with neither of these authorities. He states that the papilla has a definite mushroom-head (? upside-down) appearance, with raised edge and deep central cup, in the earliest stage.

As regards disturbance of function, in true papillœdema it is rare to find anything beyond a slight increase in size of the blind spot, whereas, even in an early stage of neuritis, definite deterioration of vision is common.

General symptoms of intracranial pressure will, of course, render the diagnosis certain, but in their absence, increased swelling of the papilla, without a corresponding decrease of visual function, points to a papillœdema.

The most difficult cases are those in which an optic neuritis is complicated by the presence of a papillœdema.

In the late stages, when atrophy has set in, it is impossible to distinguish the two conditions by the ophthalmoscope. But in this case the differential diagnosis is of comparatively little importance, in so far as any possible improvement of vision by treatment is concerned.

Horsley lays great stress on his belief that the more marked changes in the papilla, if not necessarily the greater swelling, occur always on the same side as that on which the cranial lesion is situated. Uhthoff and Mohr's statistics, quoted by the writer, do not always bear this out.

The prognosis of cases upon which no operation is performed is absolutely bad, whereas suitable operative treatment, if resorted to early, frequently results in full conservation of vision.

When possible, the disease must, of course, be radically removed, failing which a palliative operation must be performed. Of the various palliative procedures which have been advocated, *viz.*, trephine puncture of the third ventricle, drainage or puncture of the lateral ventricles, and lumbar puncture, the first is the most generally satisfactory.

The operation of puncture of the third ventricle, establishing a communication between the ventricle and subdural space, has proved useful in certain cases, but cannot be said to be applicable to all.

No set rules can be given as to the most advantageous site for trephining. This must necessarily vary in different cases, but in the great majority it is necessary to incise the dura mater. Subcutaneous drainage of the ventricle may be combined with trephining. The therapeutic value of lumbar puncture is doubtful in cases of tumour. This procedure has, however, proved beneficial in meningitis cases.

The writer concludes by again insisting on the urgent need for operative interference in the early stages by laying stress on the readiness with which the condition yields to appropriate treatment. R. AFFLECK GREEVES.

II.—PATHOLOGY.

(*Third Notice.*)

(1) **Lindner, K.—The trachoma question.** *Archives of Ophthalmology*, July, 1912.

(2) **Gaplewski.—Researches upon trachoma (Untersuchungen ueber Trachom.)** *Zeitschrift für Augenheilkunde*, März and April, 1913.

(3) **Stiel.—About blastomycetes in trachoma. (Ueber Blastomyceten bei Trachom.)** *Archiv für Augenheilkunde*, August, 1913.

(4) **Noguchi and Cohen.—Experiments on the cultivation of so-called trachoma bodies.** *Archives of Ophthalmology*, March, 1914.

(1) **Lindner** is convinced that the cases of blennorrhœa neonatorum in which Prowazek's inclusions are found are true trachoma. He has now confirmed this by inoculating monkeys with the inclusion blennorrhœa and these then showed no gonococci, pneumococci, or streptococci, only inclusions and the free initial bodies which Lindner has discovered. As monkeys cannot be inoculated with gonococci, or any organism causing conjunctivitis, except the inclusions, this proves the independence of the infection. Lindner has also found the inclusions in the male urethra and the female vagina, and the eyes of monkeys were inoculated with the dischatge from these and from cases of inclusion blennorrhœa neonatorum; in all cases, there was an infecton quite similar to the one in trachoma. Lindner thinks that these inclusions are living organisms. He has observed scar formation in inclusion blennorrhœas. ROSA FORD.

(2) **Gaplewski,** of Cologne, has used the vital staining method to examine the cellular pathology of trachoma. His paper does not lend itself to abstraction, but those interested in such researches should at least examine the plates which are made from microphotographs of his preparations. The paper may well be studied in conjunction with those published recently in the *Zeitschrift* by Junius, also of Cologne. T. HARRISON BUTLER.

(3) **Stiel,** of Cologne, reviews some of the earlier literature and refers to Lodato, who, by using Mann's method, found in the infiltrated adenoid layer and inside the trachoma follicles little bodies which Addario believed were blastomycetes. Stiel began his examinations in 1910. He found oval or round forms which were intensively stained, and which often had a double-bordered membrane. He found similar formations in the protoplasm of large epithelioid cells. With the Giemsa stain, the Hefa cells, which stain intensely, are the only ones that will be recognised. With tubercle bacillus stain, bands of Hefa cells lying one by another will often be found in trachomatous tissue. These bands are recognisable as well by low as by high magnification, and are undoubtedly Hefa, as they show many budding forms. Stiel's method was as follows.—The material was taken from the upper transition fold with a sharp instrument, so that epithelial and sub-epithelial tissue was obtained. This was smeared thinly on cleaned glass slides, dried in the air, and fixed and stained with carbol-fuchsin solution and heat. After some minutes, the slide was decolourized with Ebner solution, and washed and counter-stained with a solution of methylene blue. It is most important that the decolourizing is done properly. Here the Hefa cells will be found red in a blue background.

Stiel also obtained Hefa colonies from trachomatous material on lakmus plates. The material was taken with a sterile ring knife from the epithelial and sub-epithelial layers of the granulations. Later he found it better to use Drigolski plates and slices of potato. The plates must be freshly prepared and free from air organisms.

The Hefa colonies appear mostly after eight days. Their slow growth is attributed to the fact that they are fixed in the tissue and first must separate themselves, and, also, probably only some of the Hefa present in the tissue begin to germ in this time. The colonies are very similar, and transference by means of Drigolski's plates is easy. The Hefa colonies can be studied very well in their natural state by means of the hanging drop or the method of Nakanishi. On a clean glass slide one smears out thinly borax-methylene blue and allows it to dry. A cover slide is covered with a drop of distilled water mixed with Hefa cells. This is put on the stained slide, the borders are closed with wax and the examination is made with the oil immersion lens. The Hefa cells appear as round or oval bodies in different sizes with a simple or double-bordered membrane. The contents are not homogeneous. Most of the cells contain numerous coloured granules or a larger coloured mass which looks like a nucleus, while a more or less large border remains faintly stained, There are also within and outside the cells small opaque bodies which may be spores. Many of the cells are in a state of division, others have grown tube-like or taken irregular forms. Sometimes one sees formations which can only be explained as capsules. Stiel examined a number of school children suspected of having trachoma, and in the smear preparations, as well as in the sub-epithelial tissue, found numerous blastomycetes.

He also inoculated a pure culture of Hefa into the conjunctiva of a blind adult and observed the appearance of transparent granulations in the transition fold, which disappeared after eight to fourteen days. HANFORD MCKEE.

(4) **Noguchi and Cohen,** of New York, claim to have succeeded in cultivating the trachoma body organism outside the body. A piece of rabbit kidney, and about 10 cc. of ascitic fluid, were placed in a tube, to which the conjunctival scrapings, or a piece of excised tissue, were added. After the inoculation, a layer of 3 cm. of paraffin oil was added, and the tube kept in an anærobic jar at 37° C. for 10 days. The films were air-dried, fixed in methyl alcohol for thirty minutes, and Giemsa stained for one hour. Minute coccoids were isolated, mostly in pairs, distinguishable by their small size, and reddish stain, from the large numbers of bacteria present. The observers found the best medium one of two parts of slightly alkaline beef infusion agar, with one part of ascitic fluid, with 0·05 per cent. of glucose. A pure growth was obtained by transferring a single colony to a new tube containing a piece of sterile kidney and ascitic fluid, which after addition of paraffin oil was kept at 37° C, the anærobic apparatus being now omitted. After three or four days there was slight turbidity, and films made from the bottom of the tube, and stained with Giemsa solution, revealed the organism. Details as to staining etc., are given. R. H. ELLIOT.

III.—THE TREATMENT OF DETACHED RETINA.

Birch-Hirschfeld.—Upon the treatment of detached retina. (**Zur Therapie der Netzhautablösung.**) *Bericht der Ophthalmologischen Gesellschaft*, Heidelberg, 1913, p. 141.

Birch-Hirschfeld, of Leipzig, said that if detachment of the retina was due, as Leber and von Hippel taught, rather to the contraction of fibres in the vitreous than to an accumulation of fluid behind the retina, then it was hopeless to expect that mere drawing off of the subretinal fluid would effect a cure. It would be necessary to try to break down these contracting bonds or at any rate to loosen them. He described his own method which had yielded satisfactory results in one-third of the rather hopeless cases upon which he had tried it. A canula is passed into the subretinal space and the accumulated fluid drawn off with a syringe. The needle is now pushed into the vitreous and the subretinal fluid with an addition of normal saline injected into the vitreous. The rationale of the procedure is to press the retina into its place and so stretch the fibres which have detached the retina. The author cited thirty cases upon whom he had operated, and had observed for at least a year.

Discussion.

Elschnig, of Prague, said that he had tried Birch-Hirschfeld's operation but had not obtained the gratyfying results he had described. It was often impossible after the subretinal fluid had been evacuated to perforate the retina. In one case he had wounded the posterior capsule and cataract resulted; in another the eye was infected with a torula (*Hefe*) in spite of the most careful aseptic precautions.

Löhlein, of Griefswald, had seen a chronic inflammation follow the operation which caused the loss of the eye.

v. Hippel, jnr., of Halle, had found it impossible to puncture the retina.

T. HARRISON BUTLER.

IV.—THE TREATMENT OF LACRYMAL OBSTRUCTION.

(1) **Zimmer, P.—A simple treatment of dacryocystitis. (Traitement simple de la dacryocystite.)** *La Clinique Ophtalmologique*, 10 juillet, 1913.

(2) **Davies, D. Leighton.—Modern treatment of lacrymal obstruction.** *Lancet*, 3rd January, 1914.

(1) **Zimmer,** of Avignon, has found the following treatment efficacious even in mucopurulent dacryocystitis of several years' standing which has resisted other treatment. The punctum is dilated and, if necessary, incised, and the sac is irrigated in the usual way. A de Wecker hollow sound No. 1, smeared with cocain and adrenalin ointment, is then introduced and left in place for a quarter of an hour. A graduated glass syringe is filled with ten per cent. protargol ointment, and by means of this syringe which fits the upper end of the hollow sound, the ointment is injected into the duct as the sound is gradually withdrawn. Then, by means of the usual curved canula, the sac is filled up with protargol ointment. The amount used for the two purposes is about 1½ cubic centimetres. The patient is told not to blow the nose for several hours. Three days later the treatment is repeated. Two or three more sittings in the course of a month usually result in a cure.

ERNEST THOMSON.

(2) **Davies,** of Cardiff, after an experience of Toti's operation in ten cases, is enthusiastically in favour of it. He pleads that it is essentially an ophthalmic surgeon's operation. He considers that Toti's operation is better surgery than excision of the sac, because it is more rational and conservative, and states that it is only a little more difficult of performance. In his ten cases he has not had any instance of infection of the conjunctiva from the nose, nor any instance of discomfort resulting when the patient blows the nose.

The reviewer cannot help expressing the opinion that the author goes too far when he says that "Hitherto the subject of the treatment of lacrymal stricture has not received as careful a consideration as it demands."

ERNEST THOMSON.

V.—FOREIGN BODIES.

(1) **Lafon.—A statistical study of "occupational" foreign bodies on the cornea. (Étude statistique sur les corps étrangers professionels de la cornée.)** *Archives d'Ophtalmologie*, mai, 1911.

(2) **Birkhäuser, Rudolf.—Sudden unilateral blindness due to a foreign body entering the skull through the palate. (Plötzliche einseitige Erblindung nach perforierender Schädelverletzung vom Gaumen aus.)** *Klin. Monatsbl. f. Augenheilkunde*, Juli, 1911.

(3) **Ginestous, Étienne.—Foreign bodies in the iris and lens. (Corps étrangers de l'iris et du cristallin.)** *L'Ophtalmologie Provinciale*, octobre, 1912.

(4) **May, Charles H.—The removal of foreign bodies from the cornea and conjunctiva.** *Medical Press and Circular*, March 26th, 1913.

(5) **Mathewson, George H.—Silver style in the nasal duct: removal after forty years.** *Canadian Medical Association Journal*, March, 1913.

(6) **Danis, Marcel.—The value of the Gallemaerts' magnetometer in the diagnosis of intraocular foreign bodies.** *Ophthalmology*, July, 1913.

(7) **Elschnig, A.—Statistics of injuries of the eye caused by iron foreign bodies. (Zur Statistik der Eisensplitter Verletzungen des Auges.)** *Centralbl. f. prak. Augenheilkunde*, August und September, 1913.

(8) **Hüttemann, R.—The cases of injury to the eye by iron fragments observed in the Strassburg University Eye Clinic during the last three years. (Ueber die während der letzten drei Jahre in der Strassburger Universitäts-Augenklinik beobachteten Eisensplitterverletzungen des Auges.)** *Klin. Monatsbl. f. Augenheilkunde*, September und October-November, 1913.

(9) **Meyerhof, M.—Successful magnet operation under difficulties. (Glückliche Magnet-Ausziehung nach Hirschberg unter schwierigen äussern Umständen.)** *Centralbl. f. prak. Augenheilkunde*, November, 1913.

(10) **Mattice, Albert F.—Metal in the eye after magnet extraction.** *Archives of Ophthalmology*, January, 1914.

(11) **Alt, Adolf.—An eye with double perforation by a foreign body not located by Rœntgen rays.** *American Journal of Ophthalmology*, January, 1914.

(12) **Malot.—The diagnosis and localization of intraocular foreign bodies by rapid radiography. (Diagnostic et localisation des corps étrangers intra-oculaires par la radiographie rapide.)** *Revue Générale d'Ophtalmologie*, 31 mars, 1914.

(1) **Lafon**, of Périgueux, has evolved elaborate statistics from the study of 2,816 cases of foreign body on the cornea incurred in various industries, which presented themselves at the Bordeaux clinic between 1896 and 1906. The cases are considered under the following headings.—

Frequency.—The percentage amongst all ophthalmic cases for Bordeaux, a town in which metal industries are not numerous, is exactly 9·4 per cent. This is a higher figure than that given by Praun, of Wiesbaden, who noted from 1·35 per cent. to 7·95 per cent. according to the industrial development of a district.

Trade incidence.—The percentages found are :—workers amongst machinery 23·7 per cent., locksmiths 11·2 per cent., fitters 8·9 per cent., tinkers 6·9 per cent., metal turners 5·2 per cent., forgers 4·7 per cent., sawyers 2·3 per cent., and so on, from carpenters 1·7 per cent. to japanners 0·4 per cent., and 1·7 per cent. for various odd trades.

Nature of the foreign bodies.—This could only be determined with certainty in 300 cases: metals represented 73·3 per cent., iron alone being 63·7 per cent., and emery 14·7 per cent.

Age influence.—Among 2,181 cases ranging from 13 to 60 years of age the greatest number occurred at 17 and 18; from 19 to 23 comparatively few were noted, owing to military requirements; at 25 there was an increase again and from this age onwards to 60, a gradual fall took place.

Influence of the temperature.—Speaking generally, the hotter the weather, the greater the number of cases. From January to July and August, there is a steady increase, falling again to December.

Influence of the day.—Monday and Saturday were the days on which the greatest number occurred.

Influence of the hour.—The greatest incidence was between 5 and 6 in the evening, but a large number occur between 9 and 11 in the morning, and from 3 to 6 in the afternoon.

The eye affected.—The right eye percentage was 43·93, the left 53·06. To explain the difference, the author suggests that most workers are right-handed, and in using such a tool as a hammer for example, incline the head slightly to the right, the nose thus forms a slight protection to the right eye.

The site of the foreign bodies on the cornea is usually the lower part, as might be expected.

Lafon's conclusions are :—

1. The number of cases increases with the hours of work, the maximum being attained at the end of the day. The increase is proportional to the development of fatigue.
2. The number increases from the beginning to the end of the week, in proportion after the Sunday rest.
3. The number increases with the elevation of the temperature, which diminishes the resistance to fatigue.
4. The number is inversely proportional to the age of the patients, the younger the worker, *i.e.*, the more easily fatigued he is, the greater the incidence.

Fatigue, both mental and physical, is thus the explanation of the variations shown by the statistics. For prophylaxis it is suggested that beside the wearing of protective glasses—an act abhorred, by the way, by all workers on account of their inefficiency—some arrangement might be made to give more rest during the hours of labour, a half-hour, for example, during the afternoon, especially in the summer time. BERNARD CRIDLAND.

(2) **Birkhäuser's** patient fell on his face while smoking a long pipe. The stem of the latter penetrated through the palate into the right orbit; it was pulled out by the patient himself, who found immediately afterwards that his right eye was perfectly blind. The optic nerve became slowly atrophied; probing of the wound and Röntgen photographs made it clear, that the nerve was severed near the optic foramen. A peculiar change was seen in the

fundus: an extensive white patch, of sharp irregular outline, surrounded the disc, obscuring nowhere the retinal vessels; several hæmorrhages were seen in this white opaque area. The latter disappeared gradually in the course of a month. Birkhäuser, discussing the nature of this condition, arrives at the conclusion that it is probably due to a temporary compression of the posterior ciliary arteries. C. MARKUS.

(3) **Ginestous** reports three cases of this form of eye injury. The first was a man aged 41 years, who was struck in the right eye by a piece of metal; examination showed a wound of his cornea, and a notch in the iris, the fundus was normal, but vision was reduced to 6/10. A radiogram of the right eye demonstrated a metallic foreign body in the lens. An unsuccessful attempt was made to remove it with the electro-magnet. It was therefore decided to wait until the traumatic cataract which had commenced to develop was ready for removal. An iridectomy was made and two small fragments of zinc were removed with the soft lens matter.

The second, a man aged 21 years, was struck in the right eye with the head of a punch, there was no corneal wound, but the iris showed externally a loss of substance about the size of the head of a pin; the pupil was regular and round, but did not react to light or accommodation. Vision 5/10, fundus normal, disc congested. A radiogram showed a foreign body at the external part of the lens. It was impossible to remove it with the most powerful magnet.

The third case was a boy, aged 13 years, who was struck in the right eye by a piece of steel. On examination, there was seen a penetrating wound of cornea and iris, the lens was becoming cataractous, and the fundus details could not be made out. A radiogram showed the foreign body in the lens; again, the magnet failed to extract it. The patient was treated with potassium iodide and the protoiodide of mercury; he improved eventually.

The author concludes that lental foreign bodies are not serious, although the eye must be watched. He also discusses the matter from the point of view of compensation for injury. P. A. HARRY.

(4) Although intended primarily for the general practitioner of medicine, this article by **May**, of New York, contains more than one hint likely to be of service to the ophthalmic surgeon. For example, he condemns cocaine as an anæsthetic prior to the removal of the foreign body. Holocaine (1 per cent.), alypin (3 per cent.), or novocaine (3 per cent.) may be used, and, of the three, May prefers holocaine. Most foreign bodies are but lightly attached to the cornea. They may often be dislodged by a small cotton applicator or by a blunt spud, around the end of which has been wound a bit of absorbent cotton. It is advisable to begin by trying to brush off the foreign substance, and then, in case of failure, the cotton is wound more firmly on the instrument, and an attempt is made to push the foreign body off.

SYDNEY STEPHENSON.

(5) **Mathewson**, of Montreal, noticed a peculiar hard mass in the site of the left lacrymal sac during the routine examination of a patient prior to removal of cataract. The mass was removed, together with the lacrymal sac, and, on examination, proved to be a silver style introduced into the tear canal some forty years ago. The style was but little changed, and its head was found to be embedded in a mass of fibrous tissue, which cut off all connection between the eye, on the one hand, and the lacrymal sac, on the other. SYDNEY STEPHENSON.

(6) **Danis**, of Brussels, upholds the usefulness of the magnetometer of Gallemaerts in the detection of magnetic foreign bodies in the interior of the eye. He thinks it superior to X-rays, the giant magnet, and other methods of

diagnostic value. A description of the instrument is of little value without the accompanying diagrams, but briefly, it consists of an optical system—a telescope—and a magnetic system consisting of three magnets attached to a small mirror eight millimetres in diameter. These two parts of the apparatus are forty centimetres apart. The patient's eye is brought close to the magnetic system, while the observer looks at the mirror through the telescope. A fixed scale is reflected in the mirror, and the instrument is first set so that the observer sees a fine thread crossing the zero of the scale. If any change in the relation of the thread to the scale occurs when the patient's eye is brought into position, the presence of a foreign body is indicated. If the body is intraocular, movements of the eye will cause changes in the position of the mirror; if the body is orbital in situation, movement of the head will be required to cause movement of the mirror.

A table is appended comprising seventy cases from the Brussels clinic of Professor Gallemaerts, showing successful detection of the foreign body in every case, many of the particles being of less weight than one milligramme.

A. J. BALLANTYNE.

(7) **Elschnig,** of Prague, has collected the sixty-eight cases of eye injuries caused by bits of iron which occurred in his clinic during the last six years (not including the superficial corneal ones).

1. There were seven cases in which the foreign body was deep in the substance of the cornea or projected into the anterior chamber. One was removed with the giant magnet, one with Hirschberg's magnet, the rest with forceps or spud. None was infected when it came, and all healed well.

2. In the anterior chamber or iris, fourteen cases. Three came with suppurative irido-cyclitis and one showed itself later to have been septic. The foreign body was removed four times with the giant magnet, five times with Hirschberg's, and twice with Hirschberg's after an unsuccessful attempt with the giant magnet. Besides the four infected eyes, two others had to be removed on account of insidious irido-cyclitis—altogether six eyes.

3. In the lens, twenty cases. Two came infected and one showed itself later to have been infected. The foreign body was removed in six cases with the giant magnet, five with Hirschberg's, eight with both. One eye was immediately removed, and seven others were removed later, on account of irido-cyclitis.

4. In the vitreous or retina, twenty-one cases. Two were infected when they came, and one showed infection later. The foreign body was removed in four cases with the giant magnet, four primarily with Hirschberg's, ten with the latter after the giant had failed, one with the magnetized forceps (in contact with the giant). In two cases it could not be removed. In these two, and five others, the eye had to be removed.

5. Sticking into the sclera three cases, two infected and one not infected. The two infected eyes had to be removed after the foreign body had been extracted, one by the giant magnet, and the other with forceps.

6. With double perforation three cases. In two the foreign body was removed from Tenon's capsule by the Hirschberg magnet. Two of the eyes had to be removed on account of irido-cyclitis.

Of the sixty-eight cases, thirteen were infected by the primary injury and the eyes were lost. Of the fifty-four non-infected cases, the foreign body could not be removed in eight, and all these eight eyes were lost. Of the forty-six remaining cases, fourteen eyes had to be enucleated on account of chronic irido-cyclitis.

The general rule that an iron foreign body must be removed from the eye as soon as possible still holds good, but very occasionally there comes an exceptional case such as the following.—The foreign body is visible in the retina in the equatorial region, but the retina is extensively detached all around the foreign body. The eye is perfectly quiet. The detached retina became entirely replaced within a week, and the foreign body was extracted three days later with good result.

The opinion is expressed that both the giant magnet and Hirschberg's hand magnet are required for these operations.

Elschnig's clinic at Prague is provided with a Volkmann giant magnet, but Elschnig states that he is by no means entirely satisfied with it. A. LEVY.

(8) The number of cases dealt with in this paper by **Hüttemann**, of Strassburg, is 55.

The first section of the paper consists of a tabulation of the material, under such headings as the size, form, and position of the foreign body, the age of the patient, the history, the clinical findings, the diagnostic methods employed, presence or absence of infection, use of the magnet, later intraocular procedures, and the results of treatment.

These points are taken up in detail in the second instalment. Sixty-two per cent. of the patients were men. The largest age group was that of patients between 30 and 40, which contained 30·9 per cent. of the cases. As many as 27·4 per cent. of the cases occurred in country occupations.

In only 18·18 per cent. was it possible to see the foreign body either directly or by ophthalmoscopic examination; hence the need for diagnostic aids, such as the sideroscope and X-rays. The author obtained great satisfaction from the use of Hertel's sideroscope, with which he was able to detect the presence of iron particles weighing as little as one-sixth of a milligramme. In cases where the sideroscope gave a doubtful answer, the use of the giant magnet increased the magnetic power of the foreign body, and allowed it to give a better response on testing again with the sideroscope.

The communication comprises many other matters of interest which do not lend themselves to abstract. A. J. BALLANTYNE.

(9) The case reported by **Meyerhof**, of Cairo, is of interest as showing how success can be achieved in the face of great difficulties. The accident happened to a stupid and dirty Egyptian native on a very hot Sunday afternoon. The foreigh body had perforated the limbus. Iris and ciliary body were presenting in the wound. After great difficulties caused by failure of batteries, lack of assistance, and fainting of the patient, the foreign body was removed—it weighed 150 grm. The case was treated as an out-patient and everything went well, healing being perfect and vision afterwards good.

A. LEVY.

(10) **Mattice**, of Seattle, U.S.A., finds that metal particles may remain in the eye after magnet extraction, and in sufficient quantity to produce very deleterious effects. In order to study the source of these residues, he examined the surface of a number of iron slivers similar to those usually responsible for eye injuries, and found that even when still warm, these fragments of metal never have a smooth surface, and on moderate friction, a fine powder can be easily obtained from them, very similar to the particles he has found in injured eyes after enucleation. Apart from the question of infection, he points out the dangers of siderosis in such cases. R. H. ELLIOT.

(11) Histological articles are notoriously difficult to abstract. The essential facts in **Alt's** case follow. The eyeball was removed on account of pain, and of irritability of the fellow eye. It had been injured a year or two previously and the suspicion arose that it contained a foreign body. Plates prepared by an expert radiographer showed nothing of the kind either in the eye or orbit. There was a scar in the corneo-scleral region on the temporal side, and except

for this scar, Alt says that when he received the eye in formol, it appeared very like a normal globe. Histologically, a thick band of scar tissue stretched from the corneo-scleral scar, right through the ciliary body and vitreous, to a point about 2 mm. nasal to the optic nerve entrance. Here there was a scar in the sclera as firm as the one in the anterior part of the eye. These scars had the appearance of being healed a long time. There was traumatic cataract and replacement of part of the lens tissue with polymorphs. The retina, except at the site of the two injuries, was singularly well preserved. There was a hole at the macula. Recent inflammation was almost confined to the uveal tract, which presented the appearances described by Fuchs as characteristic of an eye which is likely to produce sympathetic disease.

ERNEST THOMSON.

(12) The methods of localization detailed by **Malot**, of Lyons, seem in the main to be those in common use and to call for no special remark. S.E.

VI.—THE POST-OPERATIVE COMPLICATIONS OF CATARACT EXTRACTION.

(1) **Lakah, C.—On certain complications coming on after the cataract operation on account of failure of formation of the anterior chamber, and on the means of remedying the same. (De certaines complications qui surviennent après l'opération de la cataracte, par suite du défaut de rétablissement de la chambre antérieure et des moyens d'y remédier.)** *La Clinique Ophtalmologique*, 10 juin, 1911.

(2) **Lagrange and Lacoste, André.—Late and subacute complications after operation for cataract. (Des complicationes subaiguës et tardives après l'opération de la cataracte.)** *Recueil d'Ophtalmologie*, septembre, 1911.

(3) **Lagrange and Lacoste. — The late subacute complications of cataract operations. (Des complications subaiguës et tardives après l'opération de la cataracte.)** *Archives d'Ophtalmologie*, décembre, 1911.

(4) **Jocqs, R.—On inflammatory conditions consecutive to the operation for cataract. (Des états inflammatoires consécutifs à l'opération de la cataracte.)** *La Clinique Ophtalmologique*, 10 décembre, 1911, and 10 janvier, 1912.

(5) **Green. John, jr.—Severe irido-cyclitis with hypopion following cataract extraction.** *American Journal of Ophthalmology*, October, 1913.

(6) **Woodruff, H. W.—Report of a case of infection following the extraction of cataract.** *Ophthalmology*, October, 1913.

(7) **Collins, E. Treacher.—Discussion on post-operative complications of cataract extractions.** *Ophthalmological Society U.K.*, April 24th, 1914.

(8) **Herbert, H.**—*Ibidem.*

(1) **Lakah's** note bears upon the occurrence and the treatment of those cases in which, after an apparently quite normal extraction, the anterior chamber remains for days empty, and in which, after twelve to fifteen days, a whitish patch appears in the cornea, more or less near the pupil centre region. If this be allowed to go on, the spot increases in size, and may interfere with the visual results of an otherwise perfectly good operation. If this spot be carefully inspected, it will be found to be in the deep layers of the cornea, and opposite to an adhesion which has formed between the posterior face of the cornea and the anterior surface of the iris, which lies against the cornea, owing to the absence of the anterior chamber. This adhesion, which is a real anterior synechia, is established only at a very limited point, most often on the pupillary edge of the iris, opposite the cut sphincter. The author considers that when this opacity appears, it is time to cauterise the corneal wound, and to use atropine, with the object of causing the anterior chamber to reform and the iris to be drawn away. Usually, such treatment is successful, and the cornea soon regains transparency. If, however, the adhesion persists after the chamber is formed, it is necessary, on account of the interference with vision, to take operative steps to break down the adhesion.

ERNEST THOMSON.

(2) **Lagrange** and **Lacoste**, of Bordeaux, reviewing one hundred cases of cataract operation came to the following conclusions with regard to post-operative infections :—

1. When the lacrymal passages are intact, and an occlusive bandage has shown that there is no conjunctivitis, the number and nature of the microbic colonies before and after the operation has no influence on the final result.

2. The conjunctival flap has a remarkable power of preventing primary infection, but appears to have but little action against late inflammations.

3. The *rôle* of fistulisation of the scar by iridic or capsulo-iridic incarceration in the wound is incontestable, but it is far from being the exclusive cause, as advanced by Duverger. It is not even preponderating.

4. The post-operative retention of cortical masses plays a very important *rôle* in the production of late complications.

5. The general health is of still greater importance, and certain diathetic states, particularly arterio-sclerosis, are eminently favourable for the production of late irido-cyclitis.

J. JAMESON EVANS.

(3) To study the ætiology of the irido-cyclitis which may occur about the fifteenth day after cataract extraction, **Lagrange** and **Lacoste**, of Bordeaux, have analysed 100 successive cases operated on by the same surgeons under the same conditions.

Cases due to reopening or fistulisation of the wound or from sympathetic causes have been excluded. The following are the conclusions drawn :—

1. When the lacrymal passages were intact and the application of the trial bandage showed that no conjunctivitis existed, the number and nature of the microbic colonies before and after the operation had no influence on the final result.

2. The conjunctival flap appears endowed with remarkable properties against primary infection, but to have but little action against late inflammation.

3. The *rôle* that fistulisation of the cicatrix by iridic or capsulo-iridic adhesion to the lips of the wound plays is incontestable, but it is far from being the sole cause, as Duverger considers. It is not even a preponderating cause.

4. The retention of *débris* plays a very important part in the appearance of late troubles.

5. The general condition of the patient has an even greater importance, and is the cause eminently favourable to late irido-cyclitis. BERNARD CRIDLAND.

(4) **Jocqs**, of Paris, reports seven instances of inflammation following operations for cataract, and concludes that late complications, such as those he describes, may be of diverse origin and of several kinds. Some of them are doubtless infective, although the infection is usually independent of the operation itself and proceeds from the bacteriological flora of the conjunctival sac. Others assume a simple irritative form, and are due, as a rule, to abundant cortical remains or to invasion of the anterior chamber by the latter. Still other forms are owing to the general health of the patient or to unfavourable conditions of the eyeball. SYDNEY STEPHENSON.

(5) In this case of cataract extraction, reported by **Green**, of St. Louis, the urine contained pus at the time of the operation. Seven days after operation there was a fully-developed irido-cyclitis and hypopyon. A good deal of local and general treatment was carried out, the essential part of the latter consisting in the administration of urotropin to the extent of 75 grains in the course of 24 hours, the drug being administered every two hours. On the third day after the commencement of the urotropin, agurin, a diuretic, was given in addition, three grains every four hours. By this time the hypopyon was entirely gone. On the following day, again, the urotropin was diminished and sodium salicylate given, fifteen grains every three hours Improvement was continuous. The urotropin was stopped at the end of a week, and the administration of aspirin commenced. Eventually V.A. was 5/8, with correction.

The writer refers to the principal facts about urotropin or hexamethylenamin, and to the experiments of Gradle upon rabbits (*Ophthalmic Record*, 1911, p. 110). We may repeat what Green says upon this subject, in view of its importance. "He (Gradle) found that in rabbits urotropin is excreted into the anterior chamber three hours after ingestion, reaches its maximum excretion in seven hours (about 1/75,000) and is excreted in greater quantities after repeated paracenteses. He noted, further, that excretion into the anterior chamber is increased by the use of mydriatics; that urotropin in the concentration in which it occurs in the anterior chamber does not inhibit the growth of virulent organisms in the test-tube. He also found that urotropin is excreted in the tears in greater concentration than in the aqueous. He believes that the drug in this weak concentration will at least weaken infecting organisms sufficiently to allow them to be more easily attacked and killed by the normal antibodies in the various secretions. This, says Gradle, would be especially true in cases of perforating injury or post-operative infection, where but few organisms gain admittance to the eye, and where there is a constant change of aqueous humour due to the opening of the anterior chamber."

In the present case, however, Green is much inclined to consider that an endogenous infection (the patient had chronic cystitis) which was rapidly becoming virulent was converted into a milder form by increasing antisepsis of the aqueous through the excretion of urotropin. ERNEST THOMSON.

(6) In the case reported by **Woodruff**, of Joliet, Illinois, there appeared on the third day after extraction hypopyon and a white infiltration zone along the lip of the wound. He injected subconjunctivally eight minims of a 1 in 1,000 cyanide of mercury solution, along with a few drops of four per cent. cocaine. This was repeated eight hours later, the wound being also treated with tincture of iodine. This treatment resulted in cure. The author's comment on the case is that since such a condition may occur without causing pain, the practice of omitting all dressing of the eye for several days after the operation is unsafe. A. J. BALLANTYNE.

(7) **E. T. Collins**, of London, deals with the post-operative complications of cataract extraction mainly from a pathological standpoint. The communication (which was the opening paper of the discussion at the Ophthalmological Society) is of a singularly lucid character, and should be read in the original. An abstract, such as that which follows, must almost necessarily fall far short of what the paper deserves.

Collins first describes the histological differences between the healing of incisions in the cornea and those made at the limbus with a conjunctival flap. In the former, the anterior wedge-shaped gap, produced by contact of the central layers of the divided *substantia propria* of the cornea, becomes filled with a plug of epithelium, extending into it from the neighbouring epithelium of the cornea. In the latter, the sub-epithelial vascular tissue of the conjunctiva fills the gap. *Apropos* healing of the conjunctival flap, the author has employed fluorescein in seven cases of cataract extraction, at varying periods after the operation, and found staining of the edges of the flap to be absent on the sixth day. On the other hand, he has observed staining as late as the eighteenth day.

Grooving of the surface of the wound, due to incomplete closure by the epithelial cells of the surface, has been seen by Collins under the following conditions: (*a*) When the patient has made an unexpected movement upwards of the eye; (*b*) When the aqueous humour has escaped beneath the conjunctiva at the counter-puncture; (*c*) When the iris has prolapsed in front of the knife.

In 1892 Collins demonstrated the presence of **an epithelial lining of the anterior chamber in eyes operated upon for cataract**. He could trace no connection between the surface epithelium, on the one hand, and the epithelium in the anterior chamber, on the other. This led him to describe the condition as an "implantation cyst," due to epithelium, detached at the moment of operation, having gained the anterior chamber, where it had proliferated, so as to cover the posterior surface of Descemet's membrane, the iris, and the anterior surface of the lens capsule. In 1901 Meller and Fuchs showed that a condition similiar to that described by Collins nine years before could be produced by an extension downwards of the surface epithelium. This condition of "epithelial cyst" may on occasion be recognised clinically. Thus, the operation at first seems to be successful, but in the course of a few months, there is superficial œdema and haze of the cornea, with increased intra-ocular tension. "The anterior chamber," says Collins, "will in one part appear exceedingly shallow, where the iris is pressed forwards by fluid unable to pass into it, and in another part, where the cyst is situated, very deep." The writer points out that the best way to avoid this complication is to make an oblique incision and a conjunctival flap.

When a conjunctival flap has been made,delayed agglutination of the wound may lead to a **down-growth of conjunctival blood-vessels between the lips of the incision**. Collins possesses specimens showing that such vessels may: (*a*) vascularise an inflammatory membrane filling the surgical coloboma; (*b*) form a connection with the vessels of a bit of iris entangled between the posterior lips of the incision, or (*c*) extend down between the lips of an incision on its distal or scleral side,

Delayed union of the posterior surface of an extraction wound may result from the interposition of iris, lens capsule, or vitreous. The aqueous under these circumstances finds its way into the *substantia propia* of the cornea, where it produces œdema, swelling, and opacity. Two views have been advanced in explanation of so-called "**striated keratitis**," which is not an inflammatory affection at all, *viz.*, (1) widening of the lymph spaces of the cornea (Becker and Recklinghausen); and (2) folding of the posterior layers of the cornea, including Descemet's membrane (Hess and Schirmer). Collins surmises that the slighter, transitory cases of this kind are caused by filtration of the aqueous humour into the substance of the cornea, due to lesions of the endothelial cells, and that the same cause accounts for the rucking of Descemet's membrane. The horizontal streaks in the cornea sometimes seen in this condition, are probably the result of lymph spaces distended with aqueous humour. It may be noted in passing that striate keratitis was observed in 15·8 per cent. of Collins' 518 cases of extraction.

The chief risk of a **cystoid cicatrix** is the liability of such an eye sooner or later to become infected by organisms that have gained entrance through the weak spot. A cystoid cicatrix of the v. Graefe type results from a prolapse of iris passing right through the wound to the conjunctival flap, so that a permanent gap is established in the fibrous capsule of the eyeball. On the other hand, if the iris does not pass through the whole thickness of the sclero-corneal tissue, it is the posterior layers only that are prevented from healing. The anterior layers of the wound heal in the usual way. Hence the scar does not stretch enough to become translucent, and so does not resemble a "cystoid scar."

As a rule, the amount of **post-operative astigmatism** is greatest in those cases where iris has become entangled between the lips of the wound. In most instances the amount tends to diminish with lapse of time. The explanation given by Thomson Henderson as to the causation of post-operative astigmatism is quoted. Readers will remember that Henderson traces the condition to two main factors: first, over-riding of the scleral by the corneal segment of the flap; and, secondly, distortion of a limbal flap by the incomplete apposition of the cut surfaces.

The pneumococcus is by far the most common pyogenic organism found in cases of **suppurative inflammation commencing in the cornea** usually on the first, second, or third day after operation. The prevalence of this complication at the Moorfields Hospital at different periods is brought out by the following figures:—

Name.	*Period.*	*Extractions.*	*Suppuration.*
Morton.	1875-6	146	5·47 per cent.
Morton.	1883	225	6·2 per cent.
Marshall.	1889-1893	1,519	1·7 per cent.
Collins.	1900-1912	518	1·15 per cent.

The period corresponding to the reduction in the number of cases of suppurative inflammation has been marked by several improvements, of which the most important probably have been sterilisation of instruments, local anæsthesia, and care in the elimination of such sources of sepsis as diseased lacrymal sac, conjunctiva, and lid margins. Some of the cases, as the author points out, can be checked by the timely use of the galvano-cautery to the infiltrated margins of the incision.

Conjunctivitis may be seen after the extraction of cataract, especially, it would appear, when conjunctivitis was present before operation or when the conjunctiva had been irritated by the employment of unduly strong antiseptics. These factors are rendered more potent for harm by the bandaging of the eye after the extraction.

Collins draws attention to the fact that in a certain number of cases careful inspection of the eye, a few days after the removal of cataract, will reveal dots (sometimes grey, but more often black) upon the back of the cornea, unaccompanied by other signs of inflammation. For example, in the four years between 1907 and 1910 inclusive, among 166 cases of cataract extraction, this form of keratitis was noted in 11·4 per cent. This "**transient keratitis punctata**," as it is called by the author, is sometimes seen after iridectomy for glaucoma apart altogether from iritis. It is suggested that the explanation of the condition is to be found in some cells from the cut surface of the iris becoming detached during the performance of the iridectomy. These become deposited upon the posterior surface of the lower half of the cornea, where they generate a chemiotactic substance, which attracts polymorphonuclear leucocytes with a view to effect its removal. Anyhow, Collins does not think "that the presence of a few transient dots on the back of the cornea, any more than one or two isolated posterior synechiæ, necessarily implies the entrance into the eye of septic organisms."

An interesting and suggestive account is given of **septic endophthalmitis** and of **sympathetic ophthalmitis.**

Among 518 extractions at Moorfields Hospital between 1900 and 1912 Collins had 5·4 per cent. of severe irido-cyclitis with keratitis punctata and 1·5 per cent. with hypopyon. There was, in addition, 0·94 per cent. of sympathetic ophthalmitis.

In discussing the ætiology of post-operative septic endophthalmitis (Fuchs), Collins disposes of a couple of a fallacies:—(1) that entanglement of the lens capsule in the wound excites inflammation by acting as a foreign substance; and (2) that soft lens matter in contact with the iris excites inflammation. The truth of the matter is that the incarcerated capsule acts by impeding union of the wound and in that way favours spread of inflammation into the interior of the eye. As to the second point, Collins believes that the mischief arises from an admixture of lens substance with the aqueous, which by those means is converted from a bad into a good medium for the growth of bacteria. *S. albus* and *B. xerosis* are often found as saprophytes in the normal conjunctival sac, and there seems little doubt that when introduced into such a favourable medium, they may assume pathogenic characters. The vitreous humour, as a rule, does not become infected, but its prolapse into the operation wound may lead to conjunctival saprophytes getting admission, and to what Straub would term "hyalitis."

Briefly, Collins suggests, then, that post-operative iridocyclitis is due to infection with organisms, which under ordinary circumstances are mere harmless saprophytes; that their entrance into the eye is facilitated by delayed closure of the extraction wound, due to an entangled lens capsule or a prolapsed vitreous; and, finally, that their growth in the anterior chamber is favoured by the suspension of lens matter in the aqueous humour.

The preventive treatment of septic endophthalmitis consists in avoiding entanglements or prolapses or the leaving of much lens matter to be dissolved by the aqueous humour. Complete sterilisation of the conjunctiva is probably impracticable.

Collins has found patches of proliferative uveitis in several eyes removed because they had set up sympathetic ophthalmitis after extraction of cataract, but they were always associated with septic endophthalmitis. These nodules were often found as scattered discrete patches in the uveal tract, from which Collins draws the conclusion that the causative infective agent must have been disseminated throughout it by the blood-stream. That conclusion, moreover, is supported by the fact that it has been shown by S. H. Browning that in many cases of sympathetic ophthalmitis there is an alteration in the cellular elements of the blood. He has also found patches of epithelioid cells with a central giant cell in the subconjunctival tissue*, in the cornea at the edges of the unhealed wound, and in a mass of exudation around the lens which had been wounded in the performance of an iridectomy.

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* See F. Deutschmann, THE OPHTHALMOSCOPE, 1913, p. 654.

The view that in sympathetic ophthalmitis the infection is endogenous and not exogenous, has the merit of affording an explanation of those cases arising from an inflammation in an exciting eye where there has been no perforating lesion, such as uveitis in association with sarcoma of the choroid.

Collins mentions the remarkable improvement that has sometimes followed the injection of salvarsan or of neosalvarsan in cases of septic endophthalmitis and of sympathetic disease.

The causes of **glaucoma** after extraction of cataract are several in number:

1. Epithelial cyst of the anterior chamber;
2. Iritis and keratitis punctata leading to changed character of the aqueous humour and to blocking of the spaces of Fontana with inflammatory cells;
3. Blocking of the angle of the anterior chamber, brought about by adhesions of the lens capsule or of the anterior hyaloid membrane of the vitreous humour to the extraction cicatrax. It is to be noted that adhesions of the capsule to a limbal incision rarely causes glaucoma.

Glaucoma from anterior synechiæ can be best relieved by division of the adhesion or adhesions by means of Lang's knives.

Expulsive hæmorrhage is much rarer after extraction of cataract than after iridectomy for glaucoma. Thus, among 518 extractions Collins lost only one eye from this complication. The bleeding takes place chiefly from the vessels of the choroid, and the risk of its occurrence is presumably reduced if the aqueous is allowed slowly to drain away instead of being allowed to escape with a gush.

If it were a common practice to examine cataract extractions with the ophthalmoscope during the first week after operation, **detachment of the choroid** would probably be found to be frequent. The ciliary body is the part most often detached, and it is rare for detachment to extend posterior to the vortex veins. The prognosis is good.

Opaque membranes left after the extraction of cataract may be grouped into three classes:—

1. Those due to lens substance retained in the capsule;
2. Those due to proliferation of the capsule cells;
3. Those due to septic endophthalmitis.

The frequency of the first form may be reduced by making a large opening in the capsule, or by washing out the soft cortical matter; of the second form by using capsule forceps; and of the third form by measures such as are likely to lessen the risk of septic endophthalmitis. Extraction of the lens in its capsule prevents the possibility of opacity due to either of the first two forms.

Collins concludes a noteworthy communication by considering **vitreous opacities** and **detachment of the retina** as they may follow the extraction of cataract. SYDNEY STEPHENSON.

(8) This communication by **Herbert,** of Nottingham, was read immediately after that of Collins (see above), and dealt with (1) septic complications; (2) discission of after-cataract; (3) prolapse of the iris; and (4) glaucoma, as they concern cataract operations. Herbert's remarks were mainly based upon his extensive experience gained in Bombay, India.

1. **Septic complications.**—In the prevention of these accidents the greatest importance is attached by Herbert to what he calls "maximum perchloride irrigation" as a preliminary to the removal of cataract. Details follow.—The application is made preferably about fifteen minutes before operation, and, of course, before cocaine has been applied to the eye. A 1 in 3,000 is the strength of the sublimate lotion. As a rule, the irrigation

is kept up for rather more than one minute. The lids are held everted, and kept moving vertically, in order to ensure penetration of the liquid to the fornices. If the application has been correctly made, there is a formation of grey mucus in the fornices and possibly about the plica semilunaris as well. The mucus is washed away with water or with normal saline. The point appears to be that the shed epithelial cells carry with them micro-organisms, even of many embedded in the superficial epithelial of the parts. As the author points out, "there can be no doubt that the conjunctiva a week or more after the operation is in a far worse state as regards the presence of pathogenic staphylococci than before operation, and worse than if no irritant application had been used."

To pass to actual experience of the foregoing and allied methods, Herbert found that free routine preliminary irrigation with perchloride lotion (at first with 1 : 2,5000 and later with 1 : 3,000) was followed by a series of 497 extractions exempt from grave acute infective accidents. A reduction both in strength and volume of the sublimate, gave one panophthalmitis and one destructive irido-cyclitis among 84 operations. A return to the 1 : 3000 solution yielded, among 571 operations, one panophthalmitis and three severe primary infections. On returning to the maximum measured use of the lotion, there was one panophthalmitis in a series of 1,172 extractions. The final series of 1,655 extractions was free from both panophthalmitis and severe acute irido-cyclitis.

It was shown by tests carried out on fifty consecutive cataract patients in Bombay, that the method of douching advocated by Herbert always succeeded in removing the *B. xerosis*, whereas staphylococci were often got rid of only partially.*

2. **Discission.**—In the course of fifteen months before he left India Herbert performed 250 needlings ten or twelve days after the removal of cataract. He was confidently persuaded of the safety of these early needlings, and among the series just spoken of he met with no serious ill-effect in any case. He employed the sublimate douch in the way described above, and entered his knife or needle subconjunctivally. Following the same practice in England, however, he has met with a couple of chronic infections in "considerably less than a hundred cases." This experience led him to surmise that the Indian experiences may not have been so successful as he was at first inclined to believe. Herbert prefers the narrow (1mm. or less in width) Graefe knife for his discission operations.

3. **Prolapse of Iris.**—Should a prolapse of the iris call for excision twenty-four hours or so after cataract extraction, sublimate douching should be practised as a preliminary, and neither speculum nor fixation forceps should be used during the little operation. When a large prolapse occurs after the simple extraction, Herbert excises only or mainly the parts of the iris left uncovered by the conjunctival flap.

4. **Glaucoma.**—This complication was rare in Herbert's Indian experiences. As probably having some bearing upon the point, it should be stated that the author commonly used an unusually extensive conjunctival flap.

SYDNEY STEPHENSON.

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* See THE OPHTHALMOSCOPE, 1906, p. 674.

VII.—OPHTHALMOLOGY AND GENERAL MEDICINE.

(*Second Notice.*)

(1) **Terson.**—Auto-enucleation of both eyes in a patient suffering from melancholia with religious delirium. (L'auto-énucléation des deux yeux dans la mélancolie avec délire religieux.) *Ann. d'Oculistique*, février, 1911.

(2) **Charles, J. W.**—Final fatal result of a case of papillœdema which had been "saved" from a palliative operation by the colour fields. *American Journal of Ophthalmology*, March, 1911.

(3) **Dutoit, A.**—A contribution to the literature of neuroparalytic keratitis. (Ein Beitrag zur Kasuistik der Keratitis neuroparalytica.) *Zeitschrift für Augenheilkunde*, März, 1911.

(4) **Fromaget.**—The oculo-sympathetic syndrome in a patient suffering from pulmonary tuberculosis. (Syndrome oculo-sympathique chez une tuberculeuse pulmonaire.) *Ann. d'Oculistique*, avril, 1911.

(5) **Hansell, Howard, F.**—Toxic paralysis of accommodation. *Ophthalmic Record*, April, 1911.

(6) **Murray, Alfred.**—A case of bilateral choked disc produced by a cyst at the cerebello-pontile angle. *Ophthalmic Record*, May, 1911.

(7) **Marenholtz, F. v.**—Two cases of hysterical blindness (fear-neurosis). (Zwei Fälle von hysterischer Amaurose [Schreck-neurose].) *Wochenschrift f. Therapie u. Hygiene d. Auges*, 9 November, 1911.

(8) **Strahan, Wm. E.**—Copiopia hysterica. *Ophthalmic Record*, December, 1911.

(9) **Fernandez, F. M.**—Ocular Leprosy. *Ophthalmology*, January, 1912.

(10) **Hansell, H. F.**—Note concerning the ocular complications of impetigo contagiosa. *Ophthalmology*, January, 1912.

(11) **Merklen, Prosper.**—Palpebral motor weakness. (La débilité motrice palpébrale.) *Gazette des Hôpitaux*, 1 février, 1912.

(12) **Verrey.**—A case of unilateral mydriasis of dental origin. Delayed eruption of a wisdom tooth. (Un cas de mydriase unilatérale d'origine dentaire. Evolution rétardée de la dent de sagesse.) *Ann. d'Oculistique*, mars, 1912.

(13) **Brown, Samuel Horton.**—Remote effects of extirpation of the Gasserian ganglion. *American Journal of Ophthalmology*, March, 1912.

(14) **Solger, B.**—Entoptic phenomenon occurring with each systole. (Ueber eine gleichzeitig mit der Systole auftretende entoptische Erscheinung.) *Centralbl. f. prak. Augenheilkunde*, Mai, 1912.

(15) **Moissonnier.**—Optic neuritis of gouty origin. (Névrite optique d'origine goutteuse.) *La Clinique Ophtalmologique*, 10 août, 1912.

(16) **Alter, F. W.**—Metastatic purulent ophthalmia. Report of a case of puerperal origin. *Ophthalmology*, July, 1912.

Rönne, Henning.—On the occurrence of a hemiopic central scotoma in disseminated sclerosis and retrobulbar neuritis. (Ueber das Vorkommen eines hemianopischen zentralen Skotoms bei disseminierter Sklerose und retrobulbärer Neuritis.) *Klin. Monatsbl. f. Augenheilkunde*, Oktober, 1912.

(18) **Mohr, Th.**—The diagnostic value of unilateral choked disc and unilateral exophthalmos in cerebral tumour. (Zur Frage der diagnostischen Verwertbarkeit der einseitigen Stauungspapille und des einseitigen Exophthalmus bei Hirntumor.) *Klin. Monatsbl. f. Augenheilkunde*, Oktober, 1912.

(19) **Gifford, H.**—A case of juvenile form of amaurotic idiocy. *Ophthalmic Record*, November, 1912.

(20) **Allport, Frank.**—A case of retrobulbar neuritis of toxæmic origin. *Ophthalmic Record*, December 1912.

(1) **Terson**, of Toulouse, records the case of a woman aged forty-one, suffering from paroxysmal melancholia, who, in a few minutes, removed both her eyes with her fingers.

He discusses the type of mental disease in which such auto-mutilations are liable to occur, and the method by which an eye can be removed without the help of any instrument, leaving as good a socket as if an enucleation had been performed *secundem artem*. R. J. COULTER.

(2) **Charles**' case was originally reported in June, 1909, and an abstract will be found in THE OPHTHALMOSCOPE for January, 1910. In the present short note it is stated that the patient has died. The author says, "I still believe that the wretched general condition of our patient warranted the avoidance of any operation with its, in this instance, highly probable shock." So far as one can gather, the operation was postponed on account of an improvement in the visual fields. ERNEST THOMSON.

(3) **Dutoit**, of Lausanne, describes a case of neuroparalytic keratitis in a child who had been run over by a cart. The disease was associated with complete fifth nerve paralysis and Horner's syndrome. The author reminds his readers that the trophic fibres in the fifth nerve are derived from the sympathetic system. He discusses the theories which have been advanced to explain the genesis of the disease, but omits to mention the work done at The National Hospital for the Paralysed and Epileptic, London, which resulted in the discovery of a bacillus —*X*, which it was suggested was the specific organism for the disease. Probably Dutoit considers bacillus —*X* to be identical with the xerosis bacillus. He concludes that the ætiology of neuroparalytic keratitis is a lesion of the trophic fibres (sympathetic) of the trigeminal nerve. The pathogenesis lies in an accidental lesion of the corneal epithelium. The proof that there are in the fifth trophic fibres for the cornea is found in the clinical fact that minimal traumata which prove harmless to the normal eye, are fraught with great danger to the anæsthetic eye caused by fifth nerve lesions. The prognosis depends upon the general condition of the patient, as well as upon the virulence of the organisms in the conjunctival secretion. Treatment must not only seek to maintain antisepsis, but also to stimulate local insular and tissue reaction. For this reason Dutoit used dionine in his case. Prophylaxis is of great importance. It is possible to avoid the complication after "Gasserectomy." T. HARRISON BUTLER.

(4) **Fromaget**, of Bordeaux, records the case of a patient, a woman aged 35, who had paralysis of the right cervical sympathetic, as evidenced by

the presence of the Claude Bernard-Homer syndrome, *i.e.*, ptosis, narrowing of the palpebral aperture, enophthalmos, myosis, and lacrymation with vaso-dilatation. There was a small hard swelling over the ascending process of the right superior maxilla, and the maxillary sinus on the right side could not be transilluminated but did not contain any fluid. General examination showed the presence of tuberculosis of the apex of the right lung, in the first stage. Under treatment, the maxillary sinus regained its transparency, but the ocular condition remained unaltered.

The author instilled drops of a solution of adrenaline into the affected eye of his patient every five minutes, and found that in forty minutes the pupil commenced to dilate, and an hour later had become as big as that of the left eye. This mydriasis lasted about three hours, and was accompanied by diminution in the ptosis. These results confirm the observations of Gautrelet and others on the subject. Loevi has shown that in normal eyes, the action of adrenaline on the pupil is inhibited by that of a substance (probably choline) secreted by the pancreas, which stimulates the resistance of the sympathetic, and it is suggested that when the latter is paralysed or the secretion of this substance is deficient, the action of adrenaline becomes evident, and incidentally provides a new proof of the existence of the much discussed dilator pupillæ. R. J. COULTER.

(5) **Hansell,** of Philadelphia, remarks on the difficulty of estimating precisely the degree of involvement of the iris and ciliary body in toxic paralysis, and the rarity of paralysis of the extrinsic muscles in chronic alcoholic poisoning. According to Uhthoff, isolated ophthalmoplegia interna never occurs in alcoholic poisoning, but Hansell records a case of paresis of sphincter pupillæ and ciliary muscle without amblyopia or scotoma in a subject who was an epileptic and a heavy drinker and smoker. The action of the pupils and accommodation returned in a few days. The author ascribed no part to the epilepsy in the ætiology of the paralysis.

Hansell records another case of ciliary and pupillary paralysis in which the only possible cause discovered was a chronic specific urethritis, and it was assumed that the paralysis was due to gono-toxins from this source.

J. JAMESON EVANS.

(6) This case by **Murray,** of Chicago, was an example of highly successful localisation of a cerebral tumour and its removal by surgical means. It also illustrated the value of ophthalmoscopic and perimetric examinations. Ophthalmoscopically it is noted that the maximum œdema of the nerve head was on the side opposite to the lesion ; the visual field was also more defective on the right side, but there was indefinite pain over the left mastoid and occipital regions, as well as loss of hearing on the left side, which helped to locate the tumour on the left side. There was marked Romberg symptom, and staggering gait with a tendency to fall to the left. The reflexes were all brisk but more so on the left side ; there was no clonus or Babinski sign. The papillœdema was 4 to 5 dioptres and in the right eye there was a marked central scotoma and concentric contraction of the field, but no inversion of the colour field. After decompression, and evacuation and *curettement* of the cyst, vision immediately improved, and five months later, the peripheral fields were full, but there was now inversion of the colour fields in both eyes and a pericentral scotoma in the right field. A year later, there was still some interlacing of the colour fields, notwithstanding the fact that there was no œdema of the papillæ and no symptoms indicative of a relapse. Another curious feature of the case was that without lenses the patient saw better before the operation than he did after it ; while with correcting lenses his vision (R. = 20/40, L. = 20/20) was better after the operation than it was before.

There was a small absolute central scotoma in the right eye which made fixation a little uncertain. The right disc was now pale and the vessels contracted; the left disc was indistinct but there was no œdema.

J. JAMESON EVANS.

(7) **Marenholtz** reports two cases of hysterical blindness arising from fear or horror.

The first, a woman, 43 years of age, after a long illness from pneumonia and kidney disease, suddenly lost a child from the same disease, then some weeks later, a friend was killed by being run over by a train. She was then very nervous and much run down. In this state a few days later she was met with the news on her way home that her house was on fire. Immediately after the vision of the left eye was found to be lost. The pupil reacted to light. Under electrical and "suggestion" treatment vision slowly returned. The field of vision remained contracted, but without reversal of the colour fields, until the sight was completely normal. In spite of fairly good vision, it was some little time before the patient believed her sight would really recover.

The second case was a young man, aged 18, who became blind in both eyes while walking in a thunder storm, after a flash of lightning which was not close to him. He had suffered previously from palpitation. Rest in bed, with "suggestion," comprised the treatment. Apart from slight congestion of the retinal veins, the fundus was normal. During recovery, constriction of the visual fields was noted. Colour as above. The mental state seemed characteristic in there being no anxiety for the future or for recovery. There was also a small anæsthetic area in the hand. Complete recovery in fourteen days.

A good differential diagnosis accompanies the paper.

W. B. INGLIS POLLOCK.

(8) **Strahan**, of St. Louis, explains that copiopia hysterica was a term applied by Förster to a condition in which the symptoms of the accommodative asthenopia of hypermetropes were present without any evident cause, or after the accommodative error had been corrected. The pathogenesis of the disease has no ocular basis, but is dependent on long-standing disease of the uterus and its adnexæ, with reflex irritation of the fifth and optic nerves. He cites two cases which were benefited by "rest and gynecologic control," by bromides, valerianates, and "refractive and psychic expedients." Locally drops of pilocarpine and holocain seemed to be of value in relieving the photophobia and mydriasis. J. JAMESON EVANS.

(9) Among 250 lepers **Fernandez**, of Havana, found ocular disease in 150. There was partial or total loss of vision in thirty. The ocular conditions found were as follows.—Loss of eyebrows and eyelashes in every case, ulceration and necrosis of palpebral tissues, entropion, ectropion, and lacrymal obstruction, conjunctivitis, conjunctival leprosy, keratitis and corneal ulcers, leprosy of the cornea (rare), iritis and uveitis and cataract.

A. J. BALLANTYNE.

(10) In the case of impetigo contagiosa of the face and other parts of the body reported by **Hansell**, of Philadelphia, there was also ulceration of the corneæ. Although corneal involvement has not hitherto been described as occurring in this disease, the fact that in this case it came and went simultaneously with the skin condition, and the similarity of the two processes makes him think that was not a coincidence, but that the same disease affected the skin and the cornea. A. J. BALLANTYNE.

(11) **Merklen's** article on the various movements of the eyelids of the two eyes, together and separately, in normal and abnormal individuals, seems to

appeal rather to the neurologist than to the ophthalmologist, and is, in addition, difficult to abstract. It should be read in the original.

ERNEST THOMSON.

(12) The patient (whose case is reported by **Verrey**, of Lausanne), a woman aged 34 years, gave a history of (1) pain at the right angle of her inferior maxilla of 18 to 20 months' duration, intermittent at first but gradually becoming more continuous and severe, and tending to radiate towards the ear and along the sterno-mastoid, (2) pain at the inner angle of the right eye spreading towards the back of the eyeball, of several weeks' duration, which had been "unbearable" for several days, and (3) dilatation of the right pupil, the onset of which was definitely fixed as coinciding with the exacerbation in the ocular pain.

On examination, the right pupil was found to be moderately dilated and to react slightly to light and to accommodation. Form and colour vision and accommodation were normal, and there was no paralysis of any of the extrinsic eye muscles. The fundus was normal. An unerupted wisdom tooth was extracted from the right lower jaw, with the result that the pupil became normal in two days, and the ocular pain disappeared gradually in the course of several weeks. The author discusses the causation of the mydriasis, and comes to the conclusion that it was spasmodic and due to a reflex transmitted either directly by the sympathetic or through the medulla, Gasserian ganglion, and ophthalmic branch of the trigeminal.

R. J. COULTER.

(14) **Solger,** of Neisse, has noticed that if in the morning he stands with his back to a sun-lit window and looks with half-closed lids at a white wall about 3 m. away, so that the latter appears dull, he sees with each systole a bright spot appear and disappear during diastole. This spot appears in the right eye above the fixation point and in the left eye below it. Its angular extent is equal to an object 20 cm. in diameter situated at a distance of 3 m. He regards it as an image of the pupil caused by the varying blood content of the iris, and thinks that it is probably normal and will occur, with varying intensity, in all eyes. A. H. LEVY.

(16) **Alter,** of Toledo, Ohio, gives an account of a case of septic endophthalmitis of puerperal origin, and at the same time summarises the chief points in the ætiology and symptomatology of the disease.

A. J. BALLANTYNE.

(17) **Rönne,** of Copenhagen, records five cases, the common feature of which is that they presented a hemiopic central scotoma, which apparently must be attributed to a primary intrapial lesion of the peripheral neurone of the visual path ; that is, in the chiasma or tract. Most of them were cases of disseminated sclerosis, and he assumes for these cases the existence of a sclerotic patch in the chiasma or tract, while in the others the symptom would be explained by the presence of an inflammatory or degenerative focus in the same situation. A. J. BALLANTYNE.

(18) **Mohr's** paper is based on an analysis of the material collected by Uhthoff for his contribution to the Graefe-Saemisch *Handbuch.* The conclusions arrived at are as follows.—While Horsley and others found the most marked fundus changes on the side of the tumour in from 74 to 95 per cent. of cases of cerebral tumour, an examination of the whole literature lends support to the view of Paton, namely, that we are not justified in localising the tumour on the basis of the intensity of the fundus changes. Pure unilateral choked disc in cerebral tumour is somewhat uncommon. In forty-one such cases choked disc was ipsolateral in 56·09 per cent. Where there was bilateral involvement of the optic nerve, the more pronounced change was on the side

of the tumour in 70·8 per cent. The unusual cases of unilateral optic neuritis showed this symptom on the same side as the tumour in 80 per cent. The comparison of published cases shows that we cannot, on the ground of the retinal changes alone, come to a conclusion as to the site of the tumour. In the cases in which choked disc was found on one side and optic atrophy on the other, the tumour was always on the side presenting the optic atrophy. Exophthalmos, apart from orbital extension of the tumour, was ipsolateral in 85 and contralateral in 15 per cent. A. J. BALLANTYNE.

(19) This case related by **Gifford**, of Omaha, Neb., belonged to the type of amaurotic idiocy described by Vogt in 1905.

The patient, a girl, aged 11 years, developed in the ordinary way until she was seven years of age, when her mind and sight began to fail. When seen by the writer, she was eleven years of age, an imbecile, but could see enough to find her way about easily. The eyes were divergent with slight constant nystagmus. Fine dustlike vitreous opacities were noticed; the optic nerves were somewhat atrophic, the vessels were rather small; and the fundus showed a fine brownish-yellow mottling and some masses of bone corpuscle-shaped pigment in the lower quadrants. She became bed-ridden and absolutely blind for some months before she died four years later, and had some attacks resembling epilepsy.

An older brother of this girl had a similar history and their father was insane for the last few years of his life and died at the age of 45 years. This type of amaurotic idiocy shows no predilection for the Jewish race.

Gifford discusses the relation between the Tay-Sachs' and the juvenile forms of family amaurotic idiocy, and gives a full bibliography.

J. JAMESON EVANS.

(20) **Allport**, of Chicago, records the case of a boy, aged 18 years, who developed symptoms of retrobulbar neuritis after an attack of catarrhal jaundice associated with intestinal disturbance. Vision was reduced to 20/200 and movement of the eye was slightly painful, but under treatment—dieting, sweating, and bowel flushing—the symptoms disappeared gradually, *pari passu* with the reduction in the amount of indican and bile pigment in the urine. J. JAMESON EVANS.

VIII.—OPERATIONS.

18—The Iris.

(1) Bourgeois.—Irido-capsulectomy. (De l'irido-capsulectomie.) *Archives d'Ophtalmologie*, mai, 1911.

(2) Mende, Roman von.—The technique of iridectomy. (Zur Technik der Iridektomie.) *Klin. Monatsbl. f. Augenheilkunde*, mai, 1912.

(3) Elschnig, A.—Irido-ectomy. (Iridoektomie.) *Klin. Monatsbl. f. Augenheilkunde*, Mai, 1912.

(4) Bey, Sameh.—Corneal fistulæ and iridectomy. (Les fistules cornéennes et l'iridectomie.) *La Clinique Ophtalmologique*, 10 mai, 1913.

(5) Harrower, David.—Two cases of chronic glaucoma simplex treated by iridotasis. *Archives of Ophthalmology*, September, 1913.

(6) **Truc, H.—Bi-iridectomy or double iridectomy; superior preliminary followed by inferior combined, in the adherent cataracts of chronic uveitis. (De la biiridectome ou iridectomie double supérieure préparatoire puis inférieure combinée dans les cataractes adhérentes de l'uvéite chronique.)** *Revue Générale d'Ophtalmologie*, 31 décembre, 1913.

(1) In cases of seclusio pupillæ after cataract extraction it is necessary to obtain as large an artificial pupil as possible, in order to avoid any chance of the pupil reclosing. To effect this, three layers must be cut through, namely, the iris, remains of exudate and pigment, and remains of lens or thickened capsule, and a portion removed, thus constituting the operation of irido-capsulectomy.

In cases suitable for operation this may sometimes be done by means of a pair of curved forceps toothed on the convexity, or even by Vacher's punch-forceps if there is enough room.

The usual method adopted by **Bourgeois**, of Reims, however, is by making use of a bent broad-needle, a blunt Tyrell's hook made of silver and slightly bent at its extremity, and a pair of de Wecker's iridectomy scissors.

The eye is fixed in its upper part and an incision made with the broad-needle in the cornea, 3 or 4 mm. from its lower border. The incision is, of course, subject to variations according to the position in which it is desired to obtain the artificial pupil. The point of the needle is directed upwards and then made to puncture the irido-capsulary membrane as high as may be desired. During withdrawal, the corneal incision is increased laterally by the sharp edges of the needle, the average incision being about 5 mm. The Tyrell's hook is next introduced on the flat, and the lower edge of the irido-capsulary membrane drawn through the corneal incision, as much as may be necessary is snipped off by de Wecker's scissors, and the operation is complete. The use of a repositor is usually unnecessary.

The author has performed the operation with satisfactory results fifteen times in ten years. BERNARD CRIDLAND.

(2) In the performance of iridectomy most operators prefer the keratome, unless, owing to shallowness of the anterior chamber, the linear knife can be used with more ease and less danger. Graefe's knife has the disadvantage that it makes a somewhat long incision, that it allows a rapid escape of aqueous, and that, if the cornea is opaque, its passage through the chamber cannot be followed.

v. Mende, of Mitau, has found the method of incision from without by means of a scalpel of use in some such cases.—Having dissected up a conjunctival flap as far as the limbus, he cuts down carefully through the sclera, so as to avoid sudden extensive opening of the chamber and escape of aqueous. After the iridectomy has been made in the usual way, the conjunctival flap is replaced and stitched if necessary. The advantages of this operation, according to v. Mende, are (1) that it allows iridectomy to be done where the anterior chamber is very shallow or even abolished; (2) that the escape of the aqueous is very gradual; (3) that by fixing the conjunctival flap during the incision pressure on the globe is avoided; (4) that by elevation of the corneal flap the iris may be inspected, in cases where the cornea is opaque; and (5) that healing of the wound is rapid, and the conjunctival flap acts as a safeguard against infection. A. J. BALLANTYNE.

(3) **Elschnig,** of Prague, after referring to the unsatisfactory results of iridectomy and iridotomy in certain cases of occluded pupil, describes a procedure which he calls "Iridoektomie," and which is claimed to give much better

results. This consists in excising a large triangular segment out of the irido-capsular diaphragm. With a linear section knife, puncture and counter-puncture are made as if for the first stage of a cataract extraction. The knife is then made to cut upwards some three millimetres and withdrawn. This leaves us with two wounds, each about 3 mm. long, one in the limbus at 10 o'clock and the other at 2 o'clock. de Wecker's scissors are inserted through the first opening, the iris is punctured with one of the points, and an oblique cut is carried down to 6 o'clock. Through the other opening a second similar cut is made, which meets the first at its lower end, and, without removing the scissors, a third cut is carried horizontally to join the upper ends of the two first incisions. The triangular piece of iris and capsule thus isolated is removed with forceps.

The paper contains details of two cases, in one of which no vitreous was lost, and in the other only a drop. A. J. BALLANTYNE.

(4) **Sameh Bey,** of Cairo, has evidently had considerable experience of corneal fistula, a condition which must be rare in Britain. He considers that the performance of an iridectomy, although it is often technically very difficult in such cases, is the best remedy. As an indication of the frequency of occurrence of corneal fistula in Egypt, it may be mentioned that Sameh Bey has performed iridectomy for this condition no fewer than 65 times in twenty-two years. ERNEST THOMSON.

(5) Following Borthen's example, **Harrower**, of Worcester, Mass., has performed iridotasis in two cases of chronic glaucoma, modifying the operation only by having the conjunctival flap held straight up by an assistant at right angles to the sclero-corneal surface, while the incision, 4 mm. to 5 mm. long, is made 1 mm. behind the upper corneo-scleral margin. The sphincter of the iris is drawn out into this wound, and left there covered with the conjunctival flap. Atropine is instilled ten minutes before the operation. The results in both cases were good, with normal tension and enlarged fields, and, in one case, increased vision and, in the other, at first diminished vision, rising later to the same as before the operation. ROSA FORD.

(6) **Truc, of** Montpellier, recommends in certain cases of cataract secondary to chronic uveitis, in which the liability to fresh attacks of inflammation after any intervention is very great, that a wide preliminary or preparatory iridectomy be performed, in order to restore the communication between the chambers of the eye. Then, after several months, the cataract can be extracted with the performance of another large iridectomy below. The author makes it a point, that the iridectomies be large and peripheral, so that eventually the pupil is wide and vertical, while the iris is reduced to two lateral segments. This large vertical pupil, is less exposed to the risk of inflammatory occlusion and its consequences than is the pupil left after ordinary iridectomy. The method is applicable to cataracts other than those consecutive to chronic uveitis, to various adherent cataracts, and to some thick secondary cataracts with occlusion of the pupil. ERNEST THOMSON.

19.—Squint.

(1) **Landolt, E.—Operations on the vertical motor muscles of the eyes. (Les opérations sur les muscles moteurs verticaux des yeux.)** *Archives d'Ophtalmologie*, octobre, 1912.

(2) **Lange, O.—The technique of advancement of ocular muscles. (Zur Methodik der Augenmuskelvorlagerung.)** *Klin. Monatsbl. f. Augenheilkunde*, November, 1912.

(3) **Landolt, E.**—On the operative treatment of squint. (Zur Operativen Behandlung des Schielens.) *Bericht der Ophthalmologischen Gesellschaft*, Heidelberg, 1912.

(4) **Elschnig.**—The technique of advancement. *Ophthalmic Record*, December, 1912.

(5) **Astruc.** — A new method for the surgical cure of strabismus. (Un nouveau procédé pour la cure chirurgicale du strabisme. La myotomie partielle.) *La Clinique Ophtalmologique*, 10 mars, 1913.

(6) **Harman, N. Bishop.**—Case of extreme hyperphoria; operation by the new subconjunctival reefing method; cure. *Proceedings of the Royal Society of Medicine*, June, 1913.

(7) **Asmus, E.** — On the significance of accurate measurement in advancement of the ocular muscles. (Ueber die Bedeutung genauer Messungen bei Augenmuskelvorlagerung.) *Zeitschrift für Augenheilkunde*, Mai und Juni, 1913.

(8) **Bettremieux.** — Some more reflections on the operation for strabismus. (Encore quelques réflexions sur l'opération du strabisme.) *Ann. d'Oculistique*, octobre, 1913.

(9) **O'Brien, John J.**—Squint and its correction. *New York State Journal of Medicine*, January, 1914.

(1) **Landolt,** of Paris, gives his experiences in the operative treatment of stabismus "sursum- et deorsum-vergens." He observes that a vertical difference between the two eyes of 20° is rarely exceeded.

Roughly speaking, tenotomy of the superior rectus produces an alteration of about 5°, but it is quite impossible to predict the exact effect of any advancement, tenotomy, or shortening which may be necessary in any given case.

He rarely performs a tenotomy, but when he does, he confines himself to simply detaching the tendon from the globe without cutting the tendinous expansions. A tenotomy so performed is more permissible in the case of the superior rectus than with any other muscle, for the diminution in power of the tenotomised muscle, equivalent to a paresis, is only apparent on looking upwards, *i.e.*, in a part of the field which is infrequently used, and which may be obviated by a slight elevation of the head.

In the case of the inferior rectus the effect of a tenotomy would be much more inconvenient to the patient, on account of the deviation in the more important downward position, although in the primary position the difference may be corrected.

Landolt never performs an inferior tenotomy. The highest degrees of vertical strabismus are due to paralysis of an elevator or depressor, and logically an advancement is indicated. The difficulties attendant on the advancement of an oblique muscle are however so great that it is not attempted, and when rectus and oblique palsies are associated, advancement of the former muscle gives such good results that it is unnecessary to consider the latter.

Several successful cases are mentioned, in which the results have been maintained for over twelve years or more, and which show the importance of effecting a considerable over-correction of the deviation at the time of operation.

Retraction after advancement occurs to a much greater degree in the case of the vertical motor muscles than the horizontal ones.

BERNARD CRIDLAND.

(2) **Lange,** of Brunswick, deals principally with the problem of the cutting-out of the sutures used to fix the advanced muscle. In performing the operation he aims at the prevention of all tension on the advanced muscle and its sutures. In advancing the internal rectus, which is the operation he describes, he first passes a suture through the conjunctiva outside the cornea. When the muscle has been laid bare, divided, and the sutures have been inserted, an assistant by means of the first thread pulls the eye over towards the nasal side while the surgeon ties the advancing sutures. The eye is then maintained in this position of over-adduction by fixing the anchoring suture to the nose with plaster strips. The eye is protected by suitable dressings. The anchoring suture is removed on the fourth day. The procedure can be reversed in advancement of the external rectus, an operation which, according to the author, is seldom indicated. A. J. BALLANTYNE.

(3) **Landolt,** of Paris, described a case with severe paresis of both interni and of the left externus. When all the ordinary therapeutic measures had failed, Landolt advanced both interni. The effect was good and the patient returned to work. Three years later he appeared again with paralysis of the left rectus inferior. The left eye stood 12° higher than the right and diverged 6°. The left inferior was advanced, and at the end of the treatment an over-correction of 12° was noted. The divergence remained as before. A few weeks later, there was perfect fusion of images, the over-correction had disappeared, and in consequence fusion became possible and the divergence spontaneously disappeared ; it was of the nature of an exophoria. The upward squint acted like a prism and abolished fusion and permitted the latent divergence to become manifest. Landolt insisted upon the necessity of over-correction when dealing with the superior and inferior recti.

T. HARRISON BUTLER.

(4) **Elschnig**, of Prague, criticises the various methods which have been suggested for the fixation of the muscle to the sclera in advancements, and strongly disapproves of Denig's proposal to carry the suture through the corneo-scleral margin into the anterior chamber.

Elschnig uses a slightly modified Ohm's method.—The muscle tendon is well exposed, and whilst held in a toothed forceps, divided with scissors ; but the edges are left adherent to Tenon's capsule. A central double armed suture is passed through the tendon and the muscle is stretched by traction on it and dissected free from the sclera with scissors. In the vertical meridian, several millimetres above and below the limbus, two other sutures are passed first through the conjunctiva and the superficial layers of the sclera in the direction of the muscle to be advanced through the upper edge of the muscle (Tenon's capsule) somewhat behind and lateral to the central suture, again through and underneath the conjunctiva through the sclera, including the insertion of the superior rectus (in the case of the upper stitch) and of the inferior rectus (lower stitch). The corneal lip of the conjunctival wound is raised and the sclera incised 2-3 millimetres away from the limbus and concentric therewith. Both needles of the central fixation suture are then passed through the superficial layers of the sclera, starting at the incision and emerging at the limbus. A single surgical knot is tied in this suture while the lateral sutures are tightly knotted, meanwhile carefully observing the position and mobility of the eyeball, and then the central suture is finally knotted. A binocular bandage is worn only for twelve or twenty-four hours. E. JAMESON EVANS.

(5) **Astruc,** of Narbonne, after traversing the well-known ground as to the unsatisfactory results, on the whole, of all methods of operating for squint, proposes to do for the muscle which is too short and too powerful

exactly what Todd has done for its tendon—the operation, namely, which Harman has recently modified (See THE OPHTHALMOSCOPE of January, 1913).

Astruc's operation, then, consists in exposing the muscle as far back as possible and making two parallel cuts into it from opposite edges of the muscle. The length of the cuts depends upon the amount of the effect desired. Astruc claims that partial myotomy is no less efficacious than complete tenotomy, and that while in the latter operation the muscle forms new adhesions and retains its length and its power, so that ultimately the effect of the operation is reduced, in his procedure the muscle is divided so far back that it does not form new adhesions and is permanently lengthened and narrowed. It may be mentioned that Astruc does not refer to the operations of Todd or of Harman. ERNEST THOMSON.

(6) **Harman**, of London, has operated by means of his reefing method of advancement on a case of extreme hyperphoria (about 14 degrees) with complete success: orthophoria resulting from the operation. For various reasons it was considered that the left superior rectus was at fault and that muscle was the one chosen for operation. ERNEST THOMSON.

(7) **Asmus,** of Düsseldorf, has obviously made a very careful study of squint operations, and his practical common-sense conclusions must commend themselves to surgeons who read his somewhat extended, but valuable, communications.

He does not approve of simple tenotomy—a partial operation has no effect worth considering; whereas a radical tenotomy often leads to a secondary divergence. He notes (and we can from our own experience fully corroborate his statement) that in some of these cases the internal rectus is found firmly attached in its correct position, and yet the eye has defective adduction and diverges. Interference with the capsule and with the lateral attachments of the muscle is the cause of its failure to act correctly. In tenotomising the internus as an aid to advancement of the externus, Asmus simply picks up the tendon itself with mouse-tooth forceps, passes a suture through it, and then divides it with the scissors without using a hook at all. This method, which is also adopted by some surgeons in England, is certainly the best. Asmus employs Landolt's advancement operation, and he states, in opposition to Worth, that the attachment to the sclera is far more likely to give way prematurely than the muscle attachment. Here, again, most surgeons who operate much for squint will probably agree with him. The author uses a binocular dressing, and keeps both eyes tied up for eight to nine days before he removes the stitches. C. Worth has insisted upon the absolute necessity of this procedure.

The second half of the paper contains a number of tables which give full details of a large number of cases, all classified with a complete account of the nature of the squint, the operations performed, and the results attained. Early orthoptic exercises are strongly recommended. Asmus likes to defer operation until the child is about eight years of age, and rarely employs general anæsthesia. T. HARRISON BUTLER.

(8) **Bettremieux,** of Roubaix, once more urges that the best surgical treatment for concomitant strabismus is tenotomy of the internal rectus of the "fixing" eye, and refers to a case in which he obtained a good result in a man, aged 28 years, as showing that the method is applicable to adults as well as children. He replies to some criticisms of his former articles by Landolt, and urges that the bad results observed after tenotomy of the deviating eye must not be quoted against his method. He is of opinion that the best training for an eye is to put it straight, and that the operations of the future will be on young patients, and consequently must be simple.

R. J. COULTER.

20.—Operations for Cerebral Tumour.

(1) **von Hippel, E.—Further communications about palliative operations in cases of choked disc. (Weitere Mittheilungen ueber die Palliativoperationen bei Stauungspapille.)** *Bericht der Ophthalmologischen Gesellschaft*, Heidelberg, 1912.

(2) **Jocqs, R.—Double œdematous optic neuritis (papillœdema) which had caused blindness, completely cured by four spinal punctures. (Névrite optique œdémateuse double (stase papillaire) ayant amené la cécité, complètement guérie par quatre ponctions rachidiennes.)** *La Clinique Ophtalmologique*, 10 janvier, 1913.

(3) **Paton, Leslie.—Indications for operation on cerebral tumour from the point of view of the ophthalmic surgeon.** *Lancet*, September 27th, 1913.

(4) **Kaelin-Benziger.—Contributions to the treatment of choked disc, especially in cerebral tumours by palliative decompressive trephining with temporary extracranial drainage of a lateral ventricle. (Beiträge zur Behandlung der Stauungspapille, ins besondere bei Hirntumoren durch Dekompressiv- (Palliativ-) Trepanation mit temorärer extrakanieller Drainage eines Seitenventrikels.)** *Zeitschrift für Augenheilkunde*, Januar und Februar, 1913.

(1) **von Hippel,** of Halle, is strongly of the opinion that as soon as a choked disc due to cerebral hypertension is found, a decompression operation ought to be performed at once without waiting until the sight begins to fail. He speaks as follows :—" The appearance of a definitely established bilateral choked disc is an absolute indication for surgical treatment. Operation should not be postponed until loss of sight takes place, but should be undertaken with fully maintained functional activity."

He adds 51 cases to the 221 he has already published, and the results obtained in these cases only confirm his original views. He, however, adds an important note, that the operations must only be performed by a surgeon who has made himself master of all the details of cerebral surgery. He quotes Horsley's views in support of his contention. He says that to-day there can be no question of the necessity of immediate interference, but only of which method is the best to adopt. Lumbar puncture is a bad operation. It is useless, and is very dangerous, especially in cases of tumours in the subtentorial region. It can only be recommended when the papillitis is probably due to meningitis serosa, but here even more energetic methods should be employed when repeated lumbar punctions have not attained the desired result. In cases which are operated upon sufficiently early, the two-stage method of decompressive trephining is the best one. It is often advisable to trephine over the cerebellum, and in some cases hydrops of the fourth ventricle has been evacuated by this method. General anæsthesia should be avoided ; in Halle, almost without exception, local anæsthesia is the method used. With reference to callosal puncture, von Hippel says that it is certain that this operation has led to complete disappearance of choked disc without consecutive atrophy, and with preservation of function even for two-and-a-half years. In some cases, however, callosal puncture fails, and the case must be trephined. In other instances callosal puncture has proved superior to trephining. In many cases callosal puncture has caused the neuritis to disappear, but atrophy has supervened. This is especially the case when there was some loss of sight previous to the operation. It is certain, too, that callosal puncture may not succeed in cases with full functional activity. von Hippel, on the whole, advises callosal puncture as an initial operation when there is no loss of function; if there be a loss, he advises immediate trephining. If callosal puncture fails, then the case should be trephined at once.

In the discussion which followed:

Axenfeld, of Freiburg i. B., agreed that if a competent surgeon be at hand early, operation is correct. It is especially necessary when the papilla and vessels show severe parenchymatous changes. It is dangerous to wait for loss of acuity and contraction of the fields of vision. In any case the slightest sign of loss of function is an absolute indication for decompression. If, however, function is absolutely normal he would wait, because some cases heal spontaneously, and a hernia cerebri is a serious matter.

T. HARRISON BUTLER.

(2) The title of the very interesting case reported by **Jocqs**, of Paris, might well have contained the information that the ætiology remained all along in doubt. The only facts which can usefully be abstracted are that the patient, a man in good circumstances, aged 35 years, developed a true papillœdema without any cause being really determined for it, and that after four spinal punctures, not only did the papillœdema disappear, but the vision came up to the normal. The author concludes that in every case of papillœdema (*stase papillaire*) treatment by spinal puncture ought to be commenced as soon as possible, in order that from the results one may obtain a basis for the prognosis.

ERNEST THOMSON.

(3) **Paton**, of London, in this short article endeavours to help the ophthalmologist who is consulted as to whether operation is necessary to prevent loss of sight, or as to whether it will be of avail in procuring any recovery when vision has already failed or begun to fail. The ophthalmic surgeon must be prepared to say what delay may be allowed in the hope of definite localising signs manifesting themselves, without serious risk to the patient's sight. Paton, after discussing the papillœdema of cerebral tumour, concludes that so long only as the papillœdema remains in the first stage without evidence of visual loss and without evidence of secondary disc changes, is it justifiable to delay palliative operation. Regarding the question as to whether we can place any reliance on a difference in the amount of papillœdema in the two eyes as a valuable factor in the localisation of the tumour, the author holds that we cannot do so. He says that the appearance of descending atrophy in one eye and optic neuritis in the other is a sign of very great value, indicating that the tumour is pressing directly on the nerve on the atrophic side; but until we have more knowledge we cannot depend on a mere difference in the amount of swelling of the two discs to determine the side on which the tumour lies.

ERNEST THOMSON.

(4) **Kaelin-Benziger**, of the private clinic "Paracelsus" in Zürich, contributes a really valuable paper upon this very important subject, a communication which should be translated into a surgical journal and widely read by general surgeons who may at any time be called upon to perform these operations which demand a *technique* which cannot be acquired by merely looking up the subject in a text-book of operative surgery. It is hardly sufficiently realised that cerebral decompression is not attained by a simple trephining, nor that the hæmorrhage may be really severe and endanger life. Special means must be adopted to limit hæmorrhage, methods indicated in this paper. The author's experience has been that by the time a given patient has been referred to a neurologist and then to a general

surgeon who may not be specially expert in brain surgery, so much time is lost that sight is not saved, and the procedure falls into disrepute. v. Hippel expressed the opinion at the Heidelberg Congress that the surgeon must have become expert in this branch of his art. Under the circumstances Benziger thinks that it is far better for the ophthalmic surgeon to make a special study of decompressive operations and perform them himself, just as the aural surgeon opens the skull to search for cerebral and cerebellar abscesses. He agrees with Axenfeld that he should also deal with the nasal sinuses when they give rise to ophthalmic complications. He himself performs his own decompressions and he describes his *technique*, which is excellent. He prefers ether narcosis aided by morphine-scopolamine injection. He turns back an osteoplastic flap in a "silent" area, and before replacing the bone he cuts it down all round by a finger's breadth, so that it only acts as a kind of pad, and cannot re-unite. Before opening the dura, he passes a trochar into the lateral ventricle, so as gradually to relieve tension. The dura is opened by a crucial incision and it is tucked in under the pericranium to avoid the formation of fresh bone in the wound. The trochar is left in for some days and is connected by a tube to a flask. The dura is only opened at once if the patient is in good condition. If there is any doubt about this, the two-stage method is adopted. Sometimes he trephines, using an electric trephine. He uses interlacing sutures or Makka's spring pins to control hæmorrhage and also surrounds the skull with a rubber tourniquet.

Early operation is essential; it does not save life, but it relieves headache, and, if performed before the functions of the optic nerves are seriously depressed, it preserves sight. If the tumour can be localised, it may sometimes be removed at a subsequent operation when the patient is in a better condition to stand a serious operation. Shock is apt to be very severe after all these procedures; it can be rendered less dangerous by taking every possible care to limit hæmorrhage. T. HARRISON BUTLER.

21.—Myopia.

(1) **Fromaget, Henri.—A case of high myopia treated by extraction of the lens. (Un cas de myopie élevée traitée par l'extraction du cristallin transparent.)** *L'Ophtalmologie Provinciale*, février, 1913.

(2) **Bufill.—The operative treatment of myopia. (Miopia: Curaçion operatoria.)** *Archivos de Oftal. Hisp.-Amer.*, July, 1913.

(3) **Lambert, Walter, E.—The surgical treatment of high myopia.** *Ophthalmology*, July, 1913.

(1) **Fromaget,** of Bordeaux, reports the case of a young woman, aged 25 years, on whom he performed the operation suggested in 1776 by Desmonceaux. In three years the myopia increased from 15 to 18 or more dioptres. There was a well-marked posterior, external staphyloma.

The operation was carried out in several sittings. There were two needlings, the first produced little or no disturbance, it was followed by a second on the third day, this produced a rapid swelling of the lens which gave rise to glaucomatous symptoms. On the fifth day linear extraction was performed, and again on the fifteenth; on this latter occasion aspiration with Redard's aspirator was combined with the extraction. The result was excellent: there was a perfectly circular pupil, no trace of any inflammation, normal fundus, normal tension, no fresh choroiditis, no retinal detachment, vision 6/10. Distant vision was not improved with spectacles; with a plus 3D. she could see to read easily.

Fromaget believes that there is no risk of retinal detachment after the operation, provided there has been no loss of vitreous; indeed, the loss of the power of accommodation will help to prevent this. Post-operative glaucoma is very rare; this condition also complicates operations that have been accompanied with loss of vitreous. In patients below 25 he advises Fukala's procedure, needling followed by evacuation by linear extraction; on the other hand, in patients above 25, Vacher's operation may be performed, that is extraction of the nucleus of the lens, followed by evacuation, later, of any remaining cortical matter. P. A. HARRY.

(2) **Bufill** thinks that the removal of the lens in cases of high myopia may be done with little risk and often great benefit to the patient. His cases, five in number, have all done well, and the patients are pleased with the result. HAROLD GRIMSDALE.

(3) The experience of **Lambert,** of New York, has convinced him that the dangers of operation in cases of high myopia have been much exaggerated The present paper deals with the results of operation on fourteen eyes of seven patients. In only three were the conditions such as are generally considered to justify operation, and it was in one of these that the only complication attributable to the operation was experienced. This was a central choroiditis which appeared in one eye six months after operation and made a good recovery. The majority of the cases had fundus changes, vitreous opacities, cataract, etc., and in all the cases both eyes were operated upon. Two of the cases have been under observation for seven years with maintained vision and without complication. Fukala's method was adopted in young subjects. In older ones he employed a preliminary iridectomy followed by extraction with capsulotomy. A. J. BALLANTYNE.

22.—Miscellaneous.

(1) **Killen, W. M.—The use of the head mirror in ophthalmic operations.** *British Medical Journal*, April 11th, 1914.

(2) **Story, John B.—Operator's mask.** *British Medical Journal*, May 30th, 1914, p. 1, 213.

(1) **Killen,** of Belfast, relates a case where the removal of a thorn from a patient's eye was facilitated by operating under the illumination afforded by an ordinary laryngeal head mirror. SYDNEY STEPHENSON.

(2) According to **Story,** of Dublin, operators who wear spectacles will find that condensation on the glasses is prevented by the simple device used for some years back in the Royal Victoria Hospital, Dublin, namely, the insertion of a flexible wire—lead does admirably—along the lower border of the slit cut in the mask for the eyes of the surgeon. By moulding the flexible wire on the nose and cheek the expired air is excluded from contact with the glasses. SYDNEY STEPHENSON.

IX.—EYE-STRAIN.

(1) **Howie, A.—Migraine and errors of refraction.** *Brit. Med. Journal*, March 11th, 1911.

(2) **Ryerson, G. Sterling.—Headaches and heterophoria.** *Dominion Medical Monthly*, October, 1911.

(3) **Ryerson, G. Sterling.—Heterophoria and headaches.** *Canada Lancet*, December, 1911.

(4) **Newcomb, John Ray.—An analytical consideration of the symptoms of eye strain with special reference to those symptoms cited to the general practitioner.** *Ophthalmic Record*, May, 1913.

(1) *Apropos* Pocock's memorandum in the *British Medical Journal* of January 28th, **Howie,** of London, points out that the cases of slight ametropia are those most likely to give most trouble both to the patient and to the refractionist. Asymmetry, too, is particularly apt to give rise to distress. Finally, the great value of retinoscopy as an exact means is mentioned.

SYDNEY STEPHENSON.

(2) **Ryerson**, of Toronto, describes the usual route of the patient with headache, who after several months, finally reaches the oculist. It may be said axiomatically that refractive headache is mostly frontal. Uterine headache is bregmatic. Heterophoric headache is occipital. Heterophoric headache is often accompanied by symptoms of a reflex or neurotic character presenting a symptom-complex which may simulate grave organic disease.

Three illustrative cases are given:—

1. Boy of 11 years complained of constant headache, and confusion of vision and mind. He lost the line when reading, was considered dull, and was being constantly reprimanded for not sitting still. When chewing, his head was jerked upwards, backwards, and to the right. Examination showed hyperopia and right hyperphoria, four degrees. Correction was worn for a time without relief. Partial tenotomy of the right superior rectus was performed. The head jerking has diminished and headaches have disappeared.

2. Illustrates the benefit of partial tenotomy of the external rectus in exophoria both for near and distance.—Mr. S., manager, had constant headache referred to the occiput and confusion in reading. Examination showed a small amount of hyperopic astigmatism, which was corrected without much benefit. A partial tenotomy of both external recti was made with most gratifying results.

3. Case three illustrates the relief of epilepsy by the treatment of hyperphoria.—W. M., aged 30, complained of severe headache which he relieved by bending his head far back. Slight epileptic attacks for a year or more. Examination showed myopia of four diopters, hyperphoria of six degrees. After correction, the right superior rectus was partially divided. This reduced the hyperphoria to two degrees. Patient steadily improved, and the attacks ceased during an observation period of two years.

Ryerson recommends partial tenotomy in all cases of hyperphoria or exophoria of three degrees or more, but would be chary about the internal rectus. Finally, he deprecates promiscuous operating for heterophoria.

HANFORD MCKEE.

(3) **Ryerson,** of Toronto, has found that heterophoria may be responsible for headache and many other symptoms. He recommends a partial tenotomy

in all cases of hyperphoria or exophoria of three degrees or upwards, although he is chary of operating upon the internal rectus. He prefers under those circumstances a small advancement of the opposing muscle (externus).

SYDNEY STEPHENSON.

(4) **Newcomb**, of Indianapolis, brings out a number of interesting facts as to the symptomatology of eye-strain and its causative refractive error, but the tabular form of the communication does not lend itself to abstract. In his five hundred cases all forms of hypermetropia constituted 47·8 per cent.; all forms of myopia 26·9 per cent.; mixed astigmatism 25·1 per cent.; compound hypermetropic astigmatism 36·8 per cent.; compound myopic astigmatism 21·1 per cent. The leading symptom in hypermetropic astigmatism was combined frontal and supraorbital headache (69·5 per cent.); in compound myopic astigmatism, on the contrary, no mention was made of combined frontal and supraorbital headache, and 68·2 per cent. cite frontal headache as a predominant symptom. Neither is this symptom mentioned in any form of myopia. In simple myopia and simple myopic astigmatism not one patient complained of sick headache, suboccipital, vertical, temporal, supraorbital, or combined supraorbital and frontal, headache.

In compound hypermetropic astigmatism every form of headache is mentioned. Nuchal pain is found in every form of ametropia, and in the highest percentage in simple hypermetropic and simple myopic astigmatism. The constancy of supraorbital, temporal, and vertical pain in compound and mixed astigmatism and their absence in other forms of error is significant. "Rapid ocular fatigue" is the rule in hypermetropia and the exception in myopia, whilst "tardy accommodation" was found more frequently in the various forms of myopia than in the hypermetropias.

J. JAMESON EVANS.

X.—THINGS OPHTHALMIC, NEW AND OLD.

Fergus, Freeland.—Things ophthalmic, new and old. *Glasgow Medical Journal*, July, 1913.

Freeland Fergus, on May 2nd, 1913, delivered a valedictory address to the Medico-Chirurgical Society of Glasgow, when he laid down the office of President.

The title, "Things Ophthalmic, New and Old," lent itself to a discursive but interesting paper, in which the author expressed many views which were original, if perhaps open to criticism.

He first, and we think rightly, objects to any attempt to express a working man's loss of wage-earning capacity in mathematical terms, based upon loss of visual acuity—an attempt which has been made by Percival and by Berry. He states that he knows a collier with a visual acuity of 1/30 earning good wages. We can go even further, for we know a man suffering from congenital aniridia and cataract, with an acuity of finger-counting at two metres, who earns his living as a packer. In most trades the author holds that the form sense, that is, extra-macular vision, is a more important factor than acuity, that is, macular vision. Snellen's types do not measure the form sense at all. Fergus applies this reasoning to the Board of Trade Sight Regulations, holding that navigation depends upon form sense, not upon acuity, and holds that the acuity demanded, nearly 5/5 in one eye and 5/15 in the other, is too high. He himself has an acuity of 5/15 partly, and yet he can readily distinguish a buoy two or three miles off.

The author has noted that when an eye is injured the fellow-eye frequently has a contracted field. This fact, which we have observed in several cases, has not received sufficient attention. It is of great importance in compensation cases.

The next question touched upon is that of a special registrable qualification for ophthalmic surgeons, similar to the one for dentists. The Oxford Diploma in Ophthalmology is stated to be "extremely inadequate," and the standard required, if it be judged by one of the books which has been issued for the instruction of graduates preparing for this examination, is said to be "deplorable." The Diploma can only be taken by those who can afford the time to take out the course of instruction given at Oxford, a course which by reason of its shortness, must be inadequate. This fact greatly limits the number of candidates and in consequence the status of the Diploma, but the standard required is certainly a high one and in no sense "deplorable." We know of at least one first-rate ophthalmic surgeon who failed to pass. Fergus suggests that the training for the diploma should comprise a thorough grounding in plane trigonometry and in the elements of the calculus. A good grounding in geometric and physical optics is essential and for *two years at least* the student should study in a physical laboratory. We ask why? To be an efficient microscopist it is quite unnecessary to understand the optical principles of the modern objective, nor does a knowledge of the optics of the telescope help the astronomer in his observations. The same applies to the ophthalmoscope and the retinoscope. We know many excellent ophthalmoscopic observers and accurate retinoscopists who have but a slight conception of the optical principles of the instruments they use so well. We utterly fail to realize that a complete mastery of Gauss' work upon the theory of lenses would help a man towards accurate refraction. A knowledge of practical pathology and bacteriology is useful, but pathology is now such a special subject in itself that, generally speaking, the busy man does well to delegate his pathological work to an expert on the subject. Midwifery, medical jurisprudence, and *materia medica* are to be omitted from the curriculum. Why the two last subjects? We gather that the specialist is not to be a fully qualified medical man, surely a retrograde step. We agree that the ophthalmologist should have a special training, but it should follow a thorough medical course, supplemented by at least a year as house-surgeon and house-physician. The eye is only part of the body, and should be studied from this standpoint. To the reviewer's mind, the correct solution of the difficulty would be that the Fellowship of the various Colleges be awarded for ophthalmology, as well as for general surgery.

Retinoscopy is next discussed, although Fergus seldom employs it. He prefers direct measurement with the refracting ophthalmoscope. This method may be useful to the presbyopic, but the ordinary man finds it untrustworthy, even for the determination of spherical errors. It does not afford much help in deciding upon the axis of the cylinder, even if its value can be measured. A mydriatic must be used, because if the patient looks at the mirror he accommodates, if he looks at an object across the room, the macular refraction is not measured, and "the refraction of the eye five degrees away from the visual axis is *quite different* from what it is at the visual axis itself." Theoretically, this may be true, but as a practical fact a good retinoscopist can estimate the true refraction in this way in the large majority of cases, and most ophthalmologists do it daily with conspicuous success. In most eyes the difference between the macular and perimacular refraction is insignificant. Fergus makes the somewhat *naïve* remark that "in some respects the introduction of a method of examination, which can be used tolerably well by a person who has never had a thorough education in the higher branches of physiological optics, is not without its drawbacks."

School clinics are not spared. We agree that 150 children cannot be refracted in an hour, but when the author demands "from twenty minutes to half-an-hour per eye," that is to say, about an hour for each child, we can only say that all hospital and school clinic work, not to mention any private practice, becomes impossible. We find that in a school clinic retinoscopy takes three minutes as an average for each child. The glasses can be put up and the prescription written in about seven minutes, which gives ten minutes for each child, or six an hour. An intelligent nurse can put up the glasses, and thus the work is much hastened.

Fergus thinks that there is much unnecessary operating in squint cases. We fear that in large hospitals the reverse is sometimes the case, but we fully agree that when an eye is amblyopic it is better to wait until the child is old enough to tolerate the operation without a general anæsthetic. This age he gives as 12 or 13 years. We find that many children of 8 years are perfect patients if a little codrenine be injected under the conjunctiva.

Fergus says that "there is no case on record in which a person, arrived at adolescence with congenital cataract present to such a degree as to prevent his reading and writing, ever by operation gained the power of reading or writing."

T. HARRISON BUTLER.

XI.—REMEDIES.

(*Seventh Notice.*)

(1) **Dutoit, A.—Serological investigations and their applications in ophthalmology. (Reserches sérologiques et leurs applications en ophtalmologie.)** *La Clinique Ophtalmologique*, 10 mars, 1914.

(2) **Charles, J. W.—A case of glaucoma caused by tuberculous scleritis with keratitis, and relieved by treatment with tuberculin.** *American Journal of Ophthalmology*, March, 1914.

(3) **Astruc, E.—Tincture of iodine in ophthalmology: corneo-conjunctival tolerance. (La teinture d'iode en ophtalmologie. Tolérance cornéo-conjonctivale.)** *La Clinique Ophtalmologique*, 10 avril, 1914.

(4) **Darrieux, J.—The treatment of ocular syphilis by salvarsan and neosalvarsan. (Le traitement de la syphilis oculaire par le salvarsan et néosalvarsan.)** *Annales d'Oculistique*, mai, 1914.

(1) The article by **Dutoit**, of Montreux, is not, as one might assume by the title, an account of personal researches. It is a mere synopsis of some of the work which has been done on the subject. S. E.

(2) This case is so fully reported by **Charles**, of St. Louis, that an abstract is hardly feasible, especially since the title gives, after all, a synopsis of the malady. It will suffice to say that under the influence of what appears to be a very vigorous tuberculin treatment, the V. A. of the affected eye rose from P. L. to 19/19, while the tension fell from 37 mm. to 27 mm. (Schiötz). The eye became perfectly quiet. S. E.

(3) The article by **Astruc**, of Narbonne, is of much interest in view of the use of iodine in ophthalmic practice. It relates how, in three cases, pure tincture of iodine (according to the new *Codex*) was dropped into patients' eyes in mistake for argyrol or protargol, and how in all three cases no harm resulted.

The first case was one of conjunctivitis in an infant. The mother, during the night, dropped in the iodine in place of argyrol, and went back to bed. The child cried continuously, and at the end of an hour, the mother realized her mistake. Astruc was called. He douched out the conjunctivæ and applied cocain ointment and warm compresses. Two days afterwards, there was no trace of the accident. The conjunctivitis seemed a little worse, but four days later, it ceased completely.

The second case was similar, but the nurse recognised the mistake at once and bathed out the conjunctivæ. Next day, while there was some conjunctival irritation, the cornea was clear.

The third case is the most convincing. An elderly woman had been operated on for entropion. Argyrol, six drops at a time, was prescribed. On one occasion the wrong bottle was taken, with the result that six drops of tincture of iodine were instilled into an open eye (overcorrected entropion). Two minutes afterwards, it was washed out. At the time the cornea was reported as opacified. The patient was seen by Astruc four days later. There was only a very slight opacity of the cornea, an ulcer which had been present was completely disinfected (*détergée*), and there was slight conjunctival injection. There was no œdema of the eyelid.

These cases suggest a freer use of iodine in ophthalmic practice.

ERNEST THOMSON.

(4) **Darrieux** has an elaborate article dealing with the results obtained in Morax's clinic at the Lariboisière Hospital, Paris, in the treatment of syphilitic diseases of the eye by salvarsan and neosalvarsan.

The injection of "606" and of "914" has not proved dangerous. Leaving aside a case of thrombosis of the superior vena cava, which must be attributed to a fault in *technique*, there remains among about two hundred patients treated one alone in which the appearance of papillary or vascular lesions followed the injection of salvarsan. This observation belonged to a period when the neutralisation of "606" was still imperfect. Late accidents were noted in none of the cases.

Arsenical treatment exerts its maximum of action :—

1. From the histological point of view, in affections of the uvea.
2. From the anatomical point of view, in affections of the anterior segment of the eye.
3. From the clinical point of view, in acute affections and in those which appear in the course of recent syphilis.

From this it results that the efficacy is greatest in acute iritis and irido-cyclitis and in gummata of the iris in the course of a recent syphilis. In chronic iritis amelioration is observed in one-half the cases; and such is inconstant in choroiditis.

In interstitial keratitis the action of salvarsan and neosalvarsan is shown especially as regards the reactional symptoms, that is to say, the signs which depend upon a concomitant affection of the uvea (iris and ciliary body). Modifications of the cornea, such as would indicate an arrested proliferation of the *treponemata*, have not been observed, except, perhaps, in one case

Affections of the retina are rebellious to arsenical treatment. The same remark applies to tabetic lesions of the optic nerve and of the oculo-motor nerves. On the other hand, when we have to deal with an affection of these nerves due to a process which is syphilitic but not tabetic, one may sometimes secure an improvement of the corresponding symptoms (restoration of sight, enlargement of the field of vision, disappearance of paralyses).

Darrieux concludes by comparing mercurial treatment with that by the newer arsenical medicaments. Gummatous processes are equally and rapidly influenced by mercury and by "606." On the contrary, neither of the agents in question possesses any marked efficacy against interstitial keratitis or the lesions of chronic uveitis, which are certainly produced by syphilis. Speaking generally, it is particularly in acute cases, marked by functional disturbances, pain, and photophobia, that arsenic appears to have a prompt action. With this end in view, salvarsan may be employed in preference to mercury. But however it acts, by direct attack upon the parasites, or by modification of the cellular elements opposed to their proliferation, we see that the arsenical compounds, while showing a truly specific action, do not realise the sterilisation of the organism for which we had hoped, and which must always remain the great desideratum of therapeutics. SYDNEY STEPHENSON.

BOOK NOTICES.

Diagnostics of the Fundus Oculi. By EDWARD L. OATMAN, M.D. Troy, New York : The Southworth Company. 1913. Sold only by subscription.

Dr. Oatman's comprehensive work consists of several parts. First, there is a volume of some three hundred pages, embellished with two hundred and thirty-four illustrations and four coloured plates. Secondly, there are a couple of portfolios, got up to resemble volumes, and containing seventy-nine stereograms and eight diagnostic cards. Lastly, there is a stereoscope the better to examine the stereograms. The whole represents a vast amount of labour and of expenditure of money, and can only be described as a credit to the author. The book deals with examination of the eye, as well as with the fundus oculi, its appearance in health, its congenital anomalies, and its diseases. Many of its text illustrations deal with pathological appearances, and are of an exceedingly artistic nature, The stereograms cover much ground, and deserve the highest praise. Each is accompanied by a description of the condition depicted.

In "Diagnostics of the Fundus Oculi," we are convinced that Dr. Oatman has produced a work likely to be of the utmost service to ophthalmic surgeons, neurologists, practitioners, teachers, and students alike. It has our cordial commendation.

Sclero-corneal Trephining in the Operative Treatment of Glaucoma. By ROBERT HENRY ELLIOT, M.D., etc., Lieut.-Colonel, I.M.S. Second Edition. London : George Pulman & Sons. 1914. Price 7s. 6d. net.

The fact that a second edition of "Sclero-corneal Trephining" has been called for within a year of its first appearance is a striking proof of the place which Lieut.-Colonel Elliot's work has won for itself in the ophthalmological world. Since interest in the problems of glaucoma was revived by the work of Herbert, Lagrange, Fergus, and Elliot, there has been a very obvious tendency for operators to depend more and more, in the treatment of glaucoma, on the practice of sclerectomy according to Elliot's *technique*. There are several good reasons for this. Most surgeons have found little difficulty in performing the operation after reading the written descriptions. Its author has devoted himself with much energy and enthusiasm to perfecting the *technique* of the operation and to elucidating the problems which it has raised. His writings are lucid, and his vast experience has enabled him to anticipate the difficulties likely to be met with by the surgeon. The operation is undoubtedly easier to perform than most of the alternative procedures; and, lastly, the most important of all, it has been found that to a very large extent it does what its author claims for it. If proof were needed of the widespread interest which the subject has aroused, it is to be found in the fact, referred to in the preface to this volume, that within the past three years the bibliography of "trephining" alone embraces no fewer than five hundred items.

In our review of the first edition of the work in THE OPHTHALMOSCOPE for April, 1913, we indicated the nature of its principal contents. In the present edition three new chapters have been added, involving an increase of some seventy pages, and a number of new illustrations are included. It differs from its predecessor broadly in that it comprises the results of another year's experience of the operation in India and elsewhere. Elliot himself has now a personal experience of over a thousand cases, and more than twenty per cent. of these have been kept under observation for periods extending from a few months to four years. This experience, together with the results of discussions at congresses and in ophthalmological literature, enables him to speak with greater confidence on many points raised in the earlier edition. There is undoubtedly a growing body of opinion favourable to the employment of the operation in acute as well as in chronic glaucoma and the author's own earlier cases support the contention that the good results are lasting. He states that his opinion in favour of prophylactic trephining of the unaffected eye has been strengthened by his further experience, but is it not too early to claim, as he does, that in these cases the operation is quite harmless and the safety of the eye is assured?

In the chapter devoted to the *technique* of the operation there has been much amplification and elaboration of detail, but the only new point of importance seems to be that the author now advocates the regular use of the two millimetre trephine, which is so used that the disc is incompletely severed at its scleral border. More or less of the disc can then be removed, according to the size of opening desired, while the large size of the opening makes it easier to deal with the iris if any difficulty arises.

It is unnecessary to follow the author into a discussion of all the points in which this volume amplifies or modifies its predecessor. On the whole, the additional evidence gives increased support to the view that in sclero-corneal trephining we have an operation which in the majority of cases of glaucoma ensures a permanent reduction of tension through the establishment of a filtering scar. The nature of this scar is still uncertain, for the histology of the successful case of trephining has not yet been worked out.

While ophthalmologists must be grateful to all those who have contributed to the establishment of the tension-reducing operation on such a sure foundation, we cannot too often remind ourselves, and Lieut.-Colonel Elliot would be the first to agree, that the highest aim of research is to elucidate the pathology of glaucoma, or of the different diseases which have been consigned to this category, and to discover the means for its prevention rather than for the relief of a single symptom.

Before the advent of the sclerectomies it had been recognised that there were cases of glaucoma which gave better results from the continued use of myotics than from operation, and there is room for investigation, especially in countries like our own where patients can be kept under observation for prolonged periods, to determine the relative merits of trephining and myotics in similar cases. Can we be sure that the reduction of tension which follows successful trephining, often to a point very much below the limits of the normal, is without prejudice to the functions of the eye? This is only one of many important questions raised by a consideration of the contents of this work.

Our concluding word must be an expression of thanks to the author for the sustained efforts he has made to perfect the *technique* of sclero-corneal trephining. He has been, no doubt, favourably situated for the working out of his problem, but nothing but his untiring devotion and open-minded attitude towards his own work and the work of others would have enabled him to carry the matter so far as he has done. A. J. BALLANTYNE.

CORRESPONDENCE.

[While THE OPHTHALMOSCOPE will at all times welcome correspondence from its readers, the Editor does not hold himself responsible for any views expressed in this column.]

MINERS' NYSTAGMUS.

To the Editor of THE OPHTHALMOSCOPE.

DEAR SIR,

On September 27th, 1913, Dr. J. Court read before the Midland Institute of Mining, Civil, and Mechanical Engineers, a paper which evidently interested the colliery experts present, and was discussed by them at considerable length. It is well known that the cause of nystagmus is still a subject in dispute. The majority of English ophthalmologists believe that the defective illumination of coal mines is the dominant factor in causing the disease, but the theory once universally accepted, namely, that it is caused by muscular overstrain, especially of the elevators, still finds adherents on the Continent. The opinion of practical non-medical mine experts is in favour of the former view. Dr. Court himself was the protagonist of the theory that defective lighting caused the disease, and he enthusiastically championed his view against the myopathic theory, which was strongly supported by the late Mr. Simeon Snell. Court pointed out the fact, now well established, that the disease was very common in safety lamp mines, even in those with thick seams, in which the men stood to their work, whereas it was almost unknown in candle mines, although candles were used in very narrow seams, in which the men had to get the coal in very awkward positions. These facts have been confirmed over and over again, and can be no longer disputed. Court, in his paper, emphasised the change which has taken place in the expert opinion of this country, which, once overwhelmingly on the side of Snell, now supports his own views with equal force.

He then went on to critcise the enactments of the Act which enable a miner to claim compensation if he has nystagmus without compelling him to prove that the disease incapacitated him from work. He also strongly condemned the recent addition of "lid clonus" as a symptom which must be accepted as evidence of the disease even if actual nystagmus be not present, and stated that he would not give a certificate of incapacity were actual oscillations of the eyes not present. He seemed to take the view, and was supported in his opinion by engineers who took part in the discussion, that malingering was not uncommon among miners. My own experience has been totally different. I have found it difficult to keep the men from returning to work long before they have recovered from the disease. Most of the colliers have wives and families and earn good money in the pits, wages which largely exceed the compensation they receive when incapacitated. In fact, I can say that I have never yet come across a case of malingering. It is true that thousands of men are able to work with nystagmus, but these are not the individuals who are compelled to seek compensation with regard to lid twitching. It has been conclusively proved that nystagmus may be absent in some cases, and yet severe lid twitching be present, and to such a degree that the miner cannot work. When I opened the discussion at the Oxford Ophthalmological Congress in 1912, upon miner's nystagmus, I demonstrated two miners who had severe lid twitching but no nystagmus. I hold that the authorities have very wisely allowed this symptom to be accepted for compensation. It is quite characteristic, and can no more be imitated in such a manner as to deceive an expert than can the nystagmus itself.

Dr. Court then described experiments he had carried out, which tended to disprove Mr. Snell's statement, that the gas caps, which indicate a dangerous amount of gas in the workings, cannot be detected by deputies who are suffering from nystagmus. He states that Snell's experiments were made with coal gas, not with fire damp (marsh gas), and that the miner was placed under conditions quite dissimilar to those obtaining in a coal mine.

Finally, Dr. Court recommended that a time limit should be placed upon the time a miner may receive compensation, and suggested four months. At the end of this period the man, if dissatisfied, might appeal to a committee of experts. He pointed out that such a time limit had been adopted in cases of gas blowers' cataract. This suggestion is very unpractical, for few cases have recovered sufficiently to be able to return to work in four months; the incapacity may persist for years; in fact it may be permanent. My own experience has been that even cured cases rapidly relapse when they returned to the old conditions, which is just what one would expect.

It was stated in the discussion that in many mines the electric lamp was being substituted for the safety lamp, and experience was showing that the increased cost of this illumination was more than balanced by the better work performed by the colliers who could see what they were doing, and in consequence did not send so much "dirt" with the coal. It is hoped, too, that with the better light the incidence of nystagmus would diminish.

Yours truly,

T. HARRISON BUTLER.

June 18th, 1914.

NOTES AND ECHOES.

Death.

WITH deep regret we have to announce the death of Alexander Ogilvy, of Clifton, Bristol, which took place with dramatic suddenness on June 10th, whilst he was discharging his duties at the Eye Hospital, Lower Maudlin Street, Bristol. The deceased gentleman was in his 51st year. He received his early education at Coleraine Academical Institute. His professional education was received at Trinity College, Dublin, and subsequently at the Universities of Vienna and Heildelberg. He was a member of the Ophthalmological Society, as well as of the Oxford Ophthalmological Congress. Dr. Ogilvy was an enthusiastic volunteer, an ardent yachtsman, the captain of the Bristol and Clifton Golf Club, and a very popular figure in the social life of the district.

* * * *

Appointments.

DR. GORDON M. HOLMES has been appointed physician to the Moorfields Hospital.

Mr. William Barrie Bownlie has been appointed assistant ophthalmic surgeon to the Blackburn and East Lancashire Royal Infirmary.

Mr. Arnold Renshaw has been appointed bacteriologist to the Manchester Royal Eye Hospital.

Mr. M. W. B. Oliver has been appointed assistant surgeon to the Central London Ophthalmic Hospital.

* * * *

Honours.

THE title of professor has been bestowed upon Dr. Wolfram, of Leipsig, Dr. Robert Hesse, of Gratz, and Dr. Adam, of Berlin.

* * * *

The Oxford Ophthalmological Congress.

A RESOLUTION of the utmost importance as regards the future of the Congress is to be submitted on Thursday, July 9th next, at Keble College, Oxford. It is as follows: "That the Council recommend that an ophthalmological congress should continue to be held annually out of London, and that the Ophthalmological Society should be approached to see if arrangements can be made for the carrying on of these extra-metropolitan meetings in addition to its annual meeting."

* * * *

Annales d'Oculistique.

THE committee of management of the *Annales d'Oculistique*, which has consisted since 1907 of Drs. Morax, Sulzer, and Valude, will include as from the 1st of July next Professor Gallemaerts, of Brussels, and MM. Dupuy-Dutemps and Rochon-Duvigneaud, of Paris.

THE OPHTHALMOSCOPE DIARY.

1914.

Oxford Ophthalmological Congress	July 8th to July 10th	Oxford.
British Medical Association: Section of Ophthalmology.	July 29th to July 31st	Aberdeen.
International Congress of Ophthalmology.	August 10th to August 15th	St. Petersburg.
American Academy of Ophthalmology and Oto-Laryngology	October 19th to October 21st	Boston, Mass.

THE

OPHTHALMOSCOPE.

A MONTHLY REVIEW OF CURRENT OPHTHALMOLOGY.

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ORIGINAL COMMUNICATIONS.

SOME EMERGENCIES IN OCULAR THERAPEUTICS.*

BY

A. DARIER, M.D.,

PARIS, FRANCE.

GENTLEMEN,—Eight years ago, before this same Congress, I described recent progress in ocular therapeutics: the new salts of silver (argyrol, collargol, and protargol), dionine, acoine, subconjunctival and intra-venous injections; novelties, all of which have now been consecrated by experience.

Quid novi since? Many things!

In the first place, radium has endowed us with the resolutive power of radiations against the most various kinds of tumours, while by its analgesic and neurasthenic power it is able to control neuralgias and paralyses.

We may salute the dawn of a new era, opened before us by the recent discoveries of that genius, Ehrlich, who has made known to us the specific tropism of some chemical agents for the microbian cells (bacteriotropism) or for those of our tissues (organotropism).

This chemotherapy has brought us a specific for syphilis, which, although it has not an absolutely sterilising power, does not any the less prevent it from being the best of the antisyphilitic remedies, complementing most happily the ancient treatment by mercury and iodides.

A new advance in chemotherapy has been made quite recently by Morgenroth, who has endowed us with a new salt of quinine possessing a special tropism for the pneumococcus, of which we all know the evil results when it infects an ulcer of the cornea or a surgical incision, I have been able to prove for myself this bacteriotropic action in several cases of infected ulcers of the cornea, which healed with remarkable rapidity under its influence; but as is the case with salvarsan, which cures not only syphilis but also traumatic or post-operative infections and sympathetic ophthalmitis, ethyl-hydrocupreine (as the remedy is termed) also has an obvious bacteriotropic action in gonococcal conjunctivitis and in dendritic keratitis. We shall appreciate later the importance of this collateral or para-specific action of medicaments. It was the affinity of certain colouring matters for determined anatomical elements which placed Ehrlich on the track of the elective affinities of the different cells; Wassermann has turned to advantage this special tropism of eosin towards cancerous cells, in order to bring to them colloidal selenium, which has a powerfully destructive action on those cells. A new treatment of cancer based upon those *data* is being studied at this moment.

Lastly, the way which has been opened to us by the genius of Jenner and Pasteur, of the prevention and cure of disease by vaccines and sera, has been widened. Antidiphtheritic serum, the first in point of time as in efficacy, has furnished its proofs; the other sera affirm more and more their specific action.

But allow me to insist upon a very important practical point.—The more widely extended employment of sera has demonstrated to the attentive observer, that, in addition to their specific action, they exercise a marked influence upon lymphocytosis, polynucleosis, phacocytosis, to say nothing of actions which we do not understand, even to-day.

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* A communication to the Oxford Ophthalmological Congress, July 9th, 1914.

It is the influence of these different factors which shows us the importance of the para-specific or collateral action of therapeutic agents. It is concerned there with a stimulation of the general defences of the organism in different infective maladies as the result of the use of antidiptheritic serum, yeast serum (Deutschmann), of mycolysine, of staphylase (Doyen), of cultures of lactic bacilli or of coli-bacilli (Massol, Taponnier), of metallic ferments, of nuclein, etc., etc.

We must never forget that in all infective diseases it is of the utmost importance for the practitioner to interfere as early as possible, the only method whereby we can secure the *abortive action*, so dear to the hearts of our forerunners. If we await the results of a bacteriological report, we risk the loss of invaluable time. It is under such conditions that para-specific sero-therapy renders yeoman service by an active stimulation of the general defences of the organism while awaiting to administer to the patient the specific antitoxins and bacteriolysins indicated by an ulterior bacteriological report. This action of the general defences may be sometimes so powerful (because undertaken early), that the truly specific remedies have almost nothing more to do ; at other times the action of those specific remedies is greatly enhanced, the ground having been well prepared by para-specific serotherapy.

The last-named presents yet another advantage, namely, that it is absolutely harmless, since it has been demonstrated that it exerts its effect just as well when given by the mouth as by parenteral injection, and we need no longer fear any accident of a seric or anaphylactic nature.

Thanks to this method of treatment, we have often been able to check traumatic or post-operative infections of the eye, as well as iritis and iridocyclitis of endogenous origin prophylactically.

As regards vaccines, the great dream of Pasteur has not yet been realised except in a small number of diseases. That is because the study of active immunisation is of the most difficult. Noteworthy progress has, however, been made in England by the important work of Sir Almroth Wright, who has taught us the better to study and to measure the action of vaccines by means of the opsonic index.

Of the numerous works that have been published on vaccine treatment in ophthalmology, they are well-known to you.

Allow me merely to ask your opinion upon a matter of the highest therapeutic importance. What does each of you think respecting the treatment of ocular tuberculosis ?

If the effects of tuberculin in pulmonary tuberculosis are still very much discussed, it is not the same in ocular therapeutics, for to-day almost all those ophthalmic surgeons who have made a systematic and prolonged study of tuberculins recognise that they exert a favourable action in the majority of the cases of ocular tuberculosis. Still, there are many points of detail that deserve to be made the subject of a thorough enquiry. I therefore suggest that this Congress should take the initiative, as regards Great Britain, in asking ophthalmic surgeons to reply to the following questions :

First.—Do you approve, and if so, why, of treatment by tuberculin ?

Second.—How many cases have you treated, and with what results ?

Third.—Have you observed any bad results from too pronounced a reaction ?

Fourth.--What tuberculins or what anti-tuberculous sera have you used and in what doses ? Have you a leaning towards any particular product ?

Fifth.—Have you used conjointly with the serum any other therapeutic agents, and if so, which ?

Sixth.—What about relapses, and the duration of treatment ?

Seventh.—What is your percentage of cures in each category of ocular diseases?

The same questions will be submitted to the forthcoming International Congress of Ophthalmology at Saint Petersburg. From the results of this collective investigation may perhaps emerge truth important for the practitioner of medicine.

THE PRESENT STATUS OF THE HETEROPHORIA QUESTION.*

BY

WENDELL REBER, M.D.,

PHILADELPHIA, PA., U.S.A.

THERE are so many phases to the heterophoria question that it is with some diffidence that we attempt a statement of its present status.

All the earlier studies of the subject were directed from the laboratory standpoint, and had to do purely with physiological optics. They were largely based on the assumption that both eyes were emmetropic and absolutely normal as to the anatomic and physiologic status of the extra-ocular muscles. From these studies issued much precious knowledge as to the horopter, the law of Listing, the law of direction, the law of projection, the doctrine of corresponding retinal points, and the action of associated and antagonistic muscles. Without this knowledge it is impossible to comprehend the phenomena attending binocular vision and the conditions actually underlying ocular palsies, strabismus, or heterophoria. On this basis, exact diagnosis of ocular palsies became possible, the view that strabismus was a purely anatomic muscular condition was abandoned, and a much better understanding of the physiology and psychology of strabismus was arrived at. For this advance all honour is due to Donders. His insistence in his epochal work on the relation between accommodation and convergence laid our foundations for all time. With him, as partakers in this strictly scientific study of strabismus, were allied Javal and Parinaud, and later Landolt, although the last-named worker, along with the elder Critchett, did more service in perfecting the operative *technique* for the correction of the secondary results of strabismus.

Soon after the appearance of Donders' work it was recognized that he had made straight the way for true scientific work in the management of strabismus; but a score of years passed before the ophthalmic profession awoke to the necessity of impressing these facts into everyday work, with the so-called lesser muscular anomalies. Constantly in their refraction work they were meeting with perversions of the normal muscular status that bore more or less definite relation to the refractive status. von Graefe (1857) was one of the first to study this latent abnormality in the "insufficiency of the internal recti" so commonly met with in myopes, and variations of his test at the reading distance are still in vogue. While he prescribed prisms in the spectacles for the relief of the condition, it is perfectly plain from his writings that he preferred the more radical method of dividing the external rectus of one or both eyes. In spite of the great weight of von Graefe's name, not much impetus was given to the study of the lesser abnormalities of muscle balance until the publication of articles by Maddox, Berry, and Priestley Smith, in England and the appearance of Geo. T. Stevens' well-known work on "Functional Nervous Diseases" in America. Stevens' work provoked a storm of criticism, some of it enthusiastic, some of it adverse. His classification of the various states of muscular imbalance has met with wide acceptance; and while some of the claims set forth in his volumes* are not generally conceded, Stevens' influence on this whole subject has been most stimulating, and has given birth to a younger school of men who may well be trusted to carry forward further investigations of the subject.

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* A communication read at the Oxford Ophthalmological Congress on July 10th, 1914.

The Anatomic Phase.

Anyone who takes the trouble to study the insertions of the tendons of the ocular muscles, will be struck with the lack of uniformity in the insertion in different eyes. Dr. Stevens, from the data supplied by Prof. Fuchs (" Beitrage zur Normalen Anatomie des Augapfels," *Archiv für Ophthalmologie*, Bd. XXX, Ab. iv. S. 1), has plated a diagram that indicates at a glance the variations in the insertions of the tendons in normal eyes. These Mercator projections, as it were, are very helpful in arriving at a correct idea, not only of the normal, but of the variations therefrom.

The average distance from the cornea of the muscular insertions is stated by Fuchs (*loc. cit.*) as follows for 31 normal eyes:—

Rectus Internus	5.5 mm.
,, Inferior	6.5 ,,
,, Externus	6.9 ,,
,, Superior	7.7 ,,

In 10 eyes that were studied by myself the following averages were found:—

Rectus Internus	5.87 mm.
,, Inferior	7.13 ,,
,, Externus	7.50 ,,
,, Superior	8.46 ,,

The greatest variations were:—

Internus	1½ mm.
Inferior	1 ,,
Externus	1½ ,,
Superior	2 ,,

Not less interesting are the figures as to the breadth of the tendinous insertions of the muscles. The accompanying table from Howe (*loc. cit.*,) gives the variations in the findings in three different investigations:—

	Fuchs.	Weiss.	Adachi.
Internal Rectus ...	10.3	10.76	9.9
Inferior ,, ...	9.8	10.35	9.0
External ,, ...	9.2	9.07	8.4
Superior ,, ...	10.6	10.75	10.0

Our own findings in 10 eyes offer these figures:—

Internal Rectus	9.90
Inferior ,, ...	9.25
External ,, ...	10.00
Superior ,, ...	9.95

Nothing is more interesting after an enucleation than to study the insertion of the muscles—to note their variability—the oblique insertion of the superior rectus and the remarkable difference in different eyes of the insertions of the oblique muscles.

In spite of all that has been written concerning the capsule of Tenon, it seems to the writer that not enough has been said concerning the manner in which the external layer of the capsule reaches forward with the fanned-out tendinous expansion of the four recti muscles to form what is practically a flat ring of fascia (or fascial collar) lying on the globe about 6½ mm. from the cornea. This has its relation to the result obtained in tenotomy if division of the tendinous expansion is done just at the insertion, in which case the secondary insertional fibres still preserve almost the full action of the muscle. To this we shall refer later on. One cannot but feel, however, that this fascial collar has much to do with compensating in some fashion for the variations in the primary insertion of the tendons, for if the variations in the breadth and distance of the insertions as above noted prevail generally (as there is strong reason to believe they do), we should encounter much greater disturbance of muscular equilibrium of the eyes than we do unless there is some correcting influence of the kind mentioned. Reference should also be made to the condensation of certain fibres of the capsule into the check ligaments which reach from the anterior portion of the capsule toward the orbital margins, especially in the lateral meridian.

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*" The Motor Apparatus of the Eyes," 1906. F. A. Davis & Co., Philadelphia, a second volume which is an amplification of the principles laid down in his first work.

Physiology.

One might wander for ever in this fascinating domain, but time does not permit. A few words must suffice. The method by which the visual apparatus so utilizes the two eyes as to resolve them into the single or cyclopean eye has been a ground of perpetual controversy. The innervations of the eyes (conjugate as they are termed) preside over their balance in all those who enjoy stereoscopic single vision. These innervations have been variously estimated. As we have elsewhere stated, five conjugate innervations have long been known, namely :—

1. Binocular elevation.
2. ,, depression.
3. ,, right rotation.
4. ,, left ,,
5. ,, convergence ; a distinct act.

There are probably a number of others, but they remain at present speculative.

Geo. C. Savage ("Ophthalmic Myology," 1902) contends that to accomplish their work the twelve ocular muscles are actuated by nine conjugate innervations. The first five correspond to those noted above. In addition to these are,

6. One to keep the vertical axes from diverging above.
7. One to prevent their converging above.
8. One to maintain the paralellism of the vertical axes and the median plane of the head when the point of view is obliquely up and to the right or down and to the left.
9. One to maintain the parallelism of the vertical axes of the eyes and the median plane of the head when the point of view is obliquely up and to the left, or down and to the right.

In his lectures before the Oxford Congress in 1911, Mr. E. E. Maddox offered a scheme of twelve binocular innervations, divided into two kingdoms.

Kingdom I—for creating the binocular eye.

Kingdom II—for directing the binocular eye.

The scheme is certainly an attractive one, and from the speculative standpoint, the most complete that has been offered. Much of this is presumptive, but until we have more investigation along the line of that of Sherrington and Russell, we are compelled to resort to some such working scheme to explain how the two eyes are made to act as one. The work of my own countryman, Le Conte, in this domain is mentioned with great pride.

The Relation between Accommodation and Convergence..

So long as the relation between accommodation and convergence was studied from the purely laboratory standpoint, not much progress was made in the practical application of this knowledge. Most of the early work postulated an emmetropic basis for the study, and many authorities adhered to the doctrine that thorough refraction under atropia with the wearing of a full correction of the refraction estimate thus made would convert the ametrope into an emmetrope, and the normal relations between accommodation and convergence would naturally follow when once the patient had become accustomed to the glasses. The doctrine that this was the sole method of approaching oculo-muscular imbalance was predestined to failure in many cases by reason of the fact that it did not reckon with three potent factors, namely :—

1. That certain individuals reveal insufficiency either in their relative accommodation or relative convergence. Chiefly is difficulty found in the direction of insufficient positive convergence, as we shall show later on.

2. That nature establishes for every one with stereoscopic (binocular) vision—be they emmetropic or ametropic—some manner of working relation between their accommodation and convergence. It is therefore unwise and unscientific to intrude too grossly or suddenly on a relation (much as it may depart from the normal or laboratory standard) which has years of habit as its basis. Too much disturbance of the whole visual apparatus and of visual judgments may issue from such a procedure, ending at times in positive refusal on the part of the patient to wear the glasses.

3. Anatomical anomalies in the insertions of the muscles or relative power of the muscles often produce a train of symptoms that refuses to yield to the correction of the refraction only.

The sedative influence of a good refraction correction on certain muscular imbalances is one of the best established clinical facts in ophthalmic practice, and I am devoted to the belief that no case of heterophoria (of large or small degree) should be viewed from the muscular standpoint, pure and simple, until the refractive status has been thoroughly dealt with and a proper correction worn for from one to two months at least.

A review of 1,000 refractive and muscular cases in my own private practice indicates that about 70 per cent. of them were relieved of their symptoms by the use of their refraction correction alone. The remaining 30 per cent. required some manner of attention to their oculo-muscular status to bring about more or less complete relief.

Relation of General Health and Heterophoria.

Here is a phase of the subject wide enough for everyone to enter into the discussion. Good health is the best counterbalancing agent against any and every deviation from the normal in the various portions of the body, and naturally this dictum holds when imbalance of the ocular muscles is the deviation from the normal under consideration. Striking illustrations of this sort are in evidence in every ophthalmic surgeon's work almost daily. I have in mind a gentleman with 5° of hyperphoria (and perfect stereoscopic vision), who has led a busy full life in the commercial world for thirty years without any direct symptoms attributable to his hyperphoria. This, I take it, is largely due to his passion for outdoor things, such as golf, horseback riding, etc. He confesses that he discovered as a young man the imperative necessity of having something to offset the mental strain imposed by his business affairs ; so that early in his career he fell into regular habits of life and devotion to outdoors as the only means of neutralizing the strain and nervousness that threatened him from time to time.

Another gentleman (this one from your own shores), who recently consulted me, stated that for twenty-five years he had been obliged to seek all the outdoor equivalents he could find; that in his college days study had been to him most irksome ; that through the years, although he had all the disposition in the world to be a great reader and student, his discomfort, headache, and somnolence after any attempt at near work had forbidden it ; that as a young man he had been practically disqualified for cricket because of an inability correctly to judge either a bowled ball when he was at the wicket or a fly ball in the field. All of these things were easily explained by the finding of a marked convergence insufficiency, complicated with a nonparetic hyperphoria. There is some ground for the belief that the gentleman's whole career was more or less influenced by the latent deviation in his ocular axes.

But what shall we say about those instances in which the relation seems reversed ?

What shall be the conclusion in the case of the bank clerk who for 15 years did everything under high Heaven to preserve his health, who devoted every hour he could to all manner of outdoor diversions (principally gardening), and whose general health leaped up by bounds within 3 months after the time his hyperphoria was corrected ?

What shall we say of the brilliant barrister who had struggled for years to maintain a most precarious health equilibrium by resorting to golf, boxing, fencing, and long walks in winter, who finally learned to loathe his desk, dictating almost everything that went on paper in his office, only to be restored to full use of his eyes in all his office work, and great improvement in his health after his convergence insufficiency had been remedied ?

What of such patients ? Shall we counsel them to abandon all near work, even to the relinquishing of a plainly manifest career ? or shall we extend to them the utmost help our art affords in the hope that their physical status will then be sufficient unto its task ?

Is it not our duty to discover whether the muscular imbalance is of the kind that will either melt away before better life habits and health, or, on the other hand, prove insuperable by such methods, and absolutely requires correction before the general health can be anywhere near restored ? In short, does not the relation work both ways ?

I am far from contending that cases of the kind above recited are the rule, but in the same breath I would remind you that they are frequently enough the exception to compel our notice.

Occupation.—This aspect of heterophoria is closely bound up with the preceding one. Indeed, had not the nineteenth century brought with it all manner of duties particularly taxing upon the eyes, the heterophoric question would not be the storm centre of discussion that it is. The work performed by the eyes in the commercial and industrial world has increased probably one hundredfold during the last hundred years. Were it not that living conditions have correspondingly improved, ocular wreckage would be strewn about us on every hand. Even as it is, the terrific strain imposed upon both accommodation and convergence in every-day life as it is led to-day is not realised by the profession in general, and for that matter even by many workers within our own ranks.

> " Earth gets its price for what earth gives us."

Civilization must be bought with a price. If it were possible to calculate in foot pounds of energy the work daily done by even normal intra- and extra-ocular muscles (as we measure foot pounds of energy in the work done by the heart), I believe the medical world would be amazed at the showing. And yet in the school room, at the loom, at the sewing machine, at the typewriter, at the accounting desk, at every labor-saving device which means less hand work and more eye work, in all the varied uses of the eyes in the industrial or commercial world, not to mention the reading of wretchedly printed morning, noon, and evening newspapers, in wretchedly lighted trains and tramcars, the abuse of the eyes goes on, and sooner or later the outraged accommodation or convergence rebels and help is sought. A most interesting fact is that the accommodative side of this problem has been pretty well worked out, while the convergence phase of it has been almost completely over-looked. The question is not so much what is the average muscle status in 100 normal individuals. This throws but meagre light on the problem. For instance, Bannister (*Annals of Ophthalmology*, 1897) in 100 accepted recruits for the United States Army, found 10 per cent. of them with hyperphoria; and Field, later (Knapp's *Archives of Ophthalmology*, 1911, No. 5), in a similar investigation of 100 United States Army recruits, found hyperphoria in 52 per cent. of them (!); however, 36 per cent. of these showed 1/2 degree or less, so that but 16 per cent. of the 100 shows 1 degree of hyperphoria or more. This is fairly close to Posey's estimate of 13 per cent. in his cases in private practice; while Howe and Williams found exactly 16 per cent. of college students to have hyperphoria. Hence, these facts taken by themselves mean nothing. A young farmer, or a labourer of any kind, may be the subject of two to three diopters of hypermetropia, and experience as little discomfort with it as a soldier with one to two degrees of hyperphoria.

Let either of these engage in an occupation requiring steady use of the eyes at 25 centimeters, and it would not be long before urgent symptoms would compel a visit to the ophthalmic surgeon. In the one case reckoning will be made with the accommodative status. In the other, the muscular status will probably require especial attention. Occupation thus takes a prominent place as one of the factors in the production of muscular asthenopia. The draughtsman who labours over a drawing board at from 12 to 14 inches all day long cannot withstand the muscular strain of an exophoria for long without symptoms. The engraver who works at 10 inches many hours a day soon finds that he must either wear a jeweller's *loupe* (and exclude the other eye) or have some particular kind of eyeglasses or spectacles made for him that will permit binocular work. And so on through the whole category of workers at what might be generally termed the "occupation distance" or 35 centimeters. These are the patients who need to counterbalance their indoor vocation with all the "outdoors" that can be made a part of their daily life.

The Age of the Patient.—When we come to consider the influence of age on the development or appearance of heterophoria, we find another weighty factor. The following table, analysing 100 consecutive cases taken from my own private records, shows the age incidence in esophoria:—

Esophoria.

Age.	No. of cases.
Under 10	9
10 to 20	10
20 to 30	28
30 to 40	22
40 to 50	16
50 to 60	9
Over 60	6

It will be seen at a glance that the greatest number of cases of esophoria follow the third decade of life. While it is true that the third decade of life embraces that period when people become conscious of their eyes, and present themselves in our consulting rooms, it will be shown in the two following tables that the same decade does not hold for exophoria and hyperphoria, so that this fact does not carry any weight.

The following table shows the age incidence for exophoria in 441 cases in private practice :—

Exophoria.

Age.	No. of cases.
Under 10	6
10 to 20	34
20 to 30	106
40 to 50	126
50 to 60	59
60 and over	20

From this table it will be readily seen that exophoria manifests itself mainly between 30 to 50 years of age—in other words, at that time of life when accommodation begins markedly to wane. Of this we shall have more to say when treating of exophoria.

The third table which follows shows the age incidence for hyperphoria in 150 cases from private practice :—

Hyperphoria.

Age.	No. of Cases.
Under 10	2
10 to 20	5
20 to 30	30
30 to 40	50
40 to 50	33
50 to 60	27
60 and over	3

As in exophoria, we see here that hyperphoria is much more frequently manifested between the thirtieth and sixtieth year of life, *i.e.*, at a time when accommodative failure helps to reveal insufficiencies in the ocular muscles. Of this also we shall speak further when discussing hyperphoria.

Age therefore becomes a very important factor in considering the problems presented by heterophoria.

Heredity.—Very little work has been done in this direction. Concerning actual strabismus (heterotropia) we have much of a definite nature showing that hereditary influence unquestionably plays some part. Worth, in 1,373 cases, found some hereditary predisposition in 52 per cent., while Holthouse, in 144 cases, puts it as 46 per cent. In my own series of 166 cases ("A Clinical and Statistical Study of Convergent Strabismus," *New York Medical Journal*, November 5, 1904), there was 33 per cent. of indubitable hereditary influence and 10 per cent. doubtful, making a total of 43 per cent., which is not far from the figures of either of the investigators just quoted. Unfortunately, there are no such data at hand on the relation to heterophoria, other than the meagre ones I presented to the American Academy of Ophthalmology at its meeting in 1908 (at Cleveland). That intrinsic hyperphoria and exophoria have a tendency to appear in more than one member of a family is a sentiment that I have harboured for some years past. This feeling was partly emphasized by the study of two and sometimes three generations of families in which it was claimed that headaches and neuralgias were hereditary. It was found in several instances that individual cranial peculiarities marked those particular members of such families who had had the same kind of headache or neuralgia as their mothers or fathers, or uncles or aunts, had had before them. They looked upon these headaches as an inheritance for which it was a waste of time to seek relief. Anyone who has worked seriously at ophthalmic science cannot but have been struck with the persistent fashion in which Nature in some families hands down from generation to generation a certain type of defective eye or eyes A familiar example is the way astigmatism will be passed on in degree and axis from parent to child. When we reflect that this means a reproduction in the child of the curvature of the parent's cornea (even to the fraction of a millimeter), we shall be duly impressed with the far-reaching influence of heredity. If such can be the close hereditary adherence in so delicate a matter as corneal curves, how much more likely is it to show forth in the balance or imbalance of the external ocular muscles? That such balance or imbalance is to a certain extent influenced by the cranial formation and orbital build, is to-day an accepted fact. S. D. Risley, in 1895, contended that " it is highly probable that the defective form of the eyeball which produces ametropia and the faulty attachment of the muscles of the globe which causes the ocular imbalance, are the direct result of defects in the shape of the bony orbit, this in turn being due to some distortion of the skull." My study of 40 cases of exophoria in seven families revealed cranial peculiarities in the direction of dolico-cephalus (long skull), but subsequent craniometric studies of 30 exophorics do not accord with the first study, and I am obliged (temporarily at least) to renounce some of my former convictions as to the cranial build in exophoria. The clinical facts, however, as to family exophoria stand, and are as follows :—

In family No. 1 there were seven members, one of whom was esophoric and *six* exophoric.

In family No. 2 there were five members, of whom one was orthophoric and the other *four* exophoric.

In family No. 3, there were fifteen members (counting cousins). Of this number ten were examined, of which number, two were esophoric and *eight* exophoric.

In family No. 4, there were five members, *all* exophoric.

In family No. 5 there were ten members with five examined. One was esophoric and *the remainder* exophoric.

In family No. 6, six out of nine members were examined, showing one esophoric (the mother), with *all the five children* exhibiting exophoria.

In family No. 7, with six members, the three that were examined were *all* exophoric.

To sum up, seven families, composing fifty-six members, were studied, and of this number, forty were personally examined. One was orthophoric, five were esophoric, and *thirty-four of the forty were exophoric.*

I have also studied three families in which there are a number of hyperphorics.

The belief is strong within me, therefore, that there are certain hereditary influences at work in many of our cases that have not been sufficiently worked out.

(*To be concluded.*)

AN IMPROVEMENT IN LOCAL ANÆSTHESIA IN OPERATIONS UPON THE EYE.*

BY

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ABOUT two months ago, I was troubled by the inadequate means at my disposal for obtaining efficient local anæsthesia in such cases of severe injury as required the prompt removal of a prolapsed portion of iris, or of a fairly large piece of steel with the magnet, and where, owing to the patients having recently taken food, a general anæsthetic was undesirable.

I tried strong solutions of cocaine, instilled into the conjunctival sac at repeated intervals for half-an-hour or more, before operation, solid cocaine, and subconjunctival injections of alypin as well. The patients always felt enough to make the bravest of them very unsteady, and the more timid quite unmanageable.

Now as we all know only too well, the safety of the eye depends on great steadiness on the part of the patient: when the patient keeps the eye open and looks quietly in the right direction, the ophthalmic surgeon can do what is necessary with the least possible bruising and disturbance of the already damaged eye.

Necessity is said to be the mother of invention: one day two cases of prolapsed iris were admitted just as I had finished operating, and could not conveniently return to operate when the patients were fit to have a general anæsthetic, so I determined to try whether I could not obtain anæsthesia of the iris and ciliary body by injecting a solution of alypin on to the course of the long and short ciliary nerves, behind the eyeball. I had a 1 per cent. solution of alypin in normal saline solution, combined with a little supra-renal extract, which I had just been using for an excision of the lacrymal sac and some plastic operations on the lids. I injected about 20 mm. deeply through Tenon's capsule, as close to the posterior pole of the eyeball as I was able, and was delighted to find, in a few minutes' time, that the patient was quite unaware that I was pulling on an inflamed iris.

I dealt with the second case in the same way and with the same success. I found the anæsthesia as complete as that of deep general anæsthesia, while free from the risks that attend the administration of a general anæsthetic.

I was so delighted with the results obtained that I determined to use deep injections of alypin for a large number of intra-ocular operations in which it is necessary to deal with the iris, and in many cases where involuntary movement or squeezing on the part of the patient would be likely to be troublesome.

I have since used it in 47 intra-ocular operations, and find that the patients are completely unconscious of what is being done to their eyes; in fact, one obtains a true anæsthesia as compared to the analgesia obtained by the methods formerly employed.

I will now proceed to deal with (1) the anatomy, (2) the *technique*, (3) the statistics, and lastly, (4) my results and criticisms.

Anatomy.—The iris and ciliary body contain a very great number of sensory nerve fibres. There is, between the sclera and the choroid and particularly in the ciliary body, in front of the ciliary muscle, a plexus of nerve fibres which supply the cornea, iris, and ciliary body; these pierce the sclera round the optic nerve and can be traced back in the form of two or three long ciliary nerves and about twenty short ciliary nerves which are arranged in two groups, an upper and a lower, which pass the short to reach the ciliary ganglion in six or eight branches, and from the ganglion by its sensory root, to reach the nasal nerve which the long ciliary nerves have reached by a direct route. Nervous impulses from the cornea, iris, and ciliary body travel by this route to reach the Gasserian ganglion and eventually the brain. In order to prevent these impulses from reaching the brain, it is necessary that the solution should reach the ciliary nerves after they leave the eyeball and preferably before they reach the nasal nerve.

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* A communication to the Oxford Ophthalmological Congress, July 10th, 1914.

The shortest route by which a needle can penetrate to this region is from the outer margin of the orbit. A straight needle can easily be introduced into the region at the back of the posterior pole of the eyeball either from the skin or the conjunctival fornix, above or below the external rectus muscle, particularly when the cornea is turned in the opposite direction.

Technique.—The conjunctival sac should be prepared and washed out in the manner usually employed before an intra-ocular operation, and the skin at the outer canthus painted with spirits of iodine, if the skin route is preferred. If time is not of importance, a 5 or 10 per cent. solution of cocaine should have been instilled into the conjunctival sac at intervals of 30, 20, and 10 minutes before operation; if time is of importance, a crystal of solid cocaine may be placed on the fold of conjunctiva which is to be injected first. A hypodermic syringe, with a graduated barrel, so that the amount of fluid injected can be measured, and a stout steel needle, with a specially sharpened point and a sterilised solution of alypin, are required.

A fold of conjunctiva is picked up with fixation forceps on the outer side of the eyeball, half-way between the fornix and the corneal margin, the needle jammed sharply through the conjunctiva and three or four minims of the fluid injected, the point of the needle being directed towards the fornix. The needle is then withdrawn, and the patient asked to look in the opposite direction to the eye which is being operated on (that is, to the right for the left eye and to the left for the right eye), and the eyeball fixed with fixation forceps. The point of the needle is then brought in contact with the conjunctiva at the fornix, just above or below the external rectus muscle, and introduced with a short sharp stab through the conjunctiva and Tenon's capsule, a few minims of solution are then injected, and the point pushed on in the direction of the posterior pole of the eyeball and 15 to 60 minims injected; the needle is then removed. The patient feels the sharp prick of the needle, but no marked discomfort.

Regulation of dose.—I find 15 to 30 minims quite sufficient to produce anæsthesia in non-inflammatory cases, while it is better to use from 30 to 60 minims in inflammatory cases, and for larger operations, such as evisceration, even more than 60 minims may be used. If the skin route is to be employed the needle is introduced at a corresponding point. A special syringe and needle have been made for me by Messrs. Weiss, and I find them less liable to bend than the ordinary ones with which I began. The solution is the one usually employed at the Sheffield Royal Infirmary, and the formula is as follows:—

Alypin gr. xv$\frac{1}{3}$
Sod. Chlor. gr. xii
Sol. Adren. Chlor. (1—1000) m.x.
Aq. ad. ℥iii$\frac{1}{2}$.

I have employed this method in the following cases:—

Sclerostomy	13
Cataract	13
Evisceration	7
Iridectomy	9
Steel removed by magnet	3
Division of synechiæ	2
Total ...	47

In all cases I obtained practically complete anæsthesia. As regards evisceration, the patients could feel any pulling on the ocular muscles, but were glad they had not had a general anæsthetic. In one very nervous patient (not included in this list), a very light general anæsthetic was given in addition to the injection, and the eye was eviscerated without trouble. In the removal of pieces of steel, (one of the most painful operations of which I know) since I have used alypin in this way, patients have not felt any pain and have not required the administration of a general anæsthetic. The last one on whom I employed this *technique* allowed me to remove a large piece of steel, and appeared to be totally unconscious that anything was being done. I think it will make this class of operation much easier and more successful in future, as no general anæsthetic will be required, and one will obtain the willing co-operation of the patient.

Removal of prolapsed iris.—This is quite painless with this *technique.* In operations for glaucoma, and sclerostomy with iridectomy, the patient is quite unconscious that anything is being done, and does not feel any manipulation of the iris.

Iridectomy.—This is quite painless. Division of anterior synechiæ is also quite painless. Extraction of cataract: where a simple extraction is to be done, followed, if necessary, by a late iridectomy, it is of the greatest importance that the patient should not squeeze when the iris is touched, as nervous patients are apt to do under cocaine alone. Some patients squeeze so badly as to make it very difficult and dangerous to perform an iridectomy after the lens has been removed. In the cases where I have injected alypin this trouble has been entirely removed.

Complications.—Post-operative vomiting: this has occurred in one case of glaucoma, in three cases of cataract extraction, and in one case of evisceration. The vomiting was not quite so severe as that which follows general anæsthesia, being neither so violent nor so prolonged. It occurred in very nervous patients, on whom it would have been impossible to have operated without a general anæsthetic, and one of whom had vomited after extraction of her other lens under cocaine alone. There have been no ill effects on the eye, except in one case where I had operated on an old blind glaucomatous eye, and here some hæmorrhage took place into the wound, but did not do any permanent damage.

Proptosis.—There was no obvious proptosis in any of my cases. In one case in which I injected 60 to 70 minims. for evisceration of a freshly injured eye, there was a little proptosis, but not enough to cause any disquiet. There have been no bad results in any other respect. Visual acuity has been perfectly satisfactory, there has been no retardation of the healing of the wound, and no septic conditions have arisen.

Toxic Effects.—I have had no toxic effects even after using large doses. The solution is in general use by my surgical colleagues, who have had no toxic effects while it is freely used in the casualty room.

I have brought this suggestion forward at a very early date. It is a very simple one, and is on all fours with the method of producing local anæsthesia which is now frequently used for operations on the extremities.

I have no doubt some imperfections will be found, and the limits of its usefulness worked out by many besides myself, but I do not feel that I would be justified in keeping back what might help other ophthalmic surgeons to do their work with greater comfort to their patients and to themselves. Other drugs, such as novocaine, I have not yet had time to try. I have so far only used alypin and adrenaline, so as not to cause any confusion in my results.

THE RESULTS OF MODERN GLAUCOMA OPERATIONS.*

BY

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THERE can be little doubt that at the present time ophthalmic surgeons are more interested in the glaucoma question than in any other branch of ophthalmic surgery, and that to-day more attention is being devoted to the operative treatment of this disease than during any previous epoch in the history of ophthalmology.

Iridectomy in the case of chronic glaucoma has been tried, found guilty, executed, and decently interred ; and newer methods have to a very large extent replaced von Graefe's classical operation. Herbert has given us his "wedge" method and the "small flap" operation. Lagrange has perfected his sclerectomy, Freeland Fergus and Elliot have reintroduced and developed Argyll Robertson's trephining, and Holth has devised the punch operation. During the past seven years we have in chronic glaucoma gradually abandoned iridectomy in favour of one or other of these recent procedures, and we venture to bring before you the results of our work in this new field, together with those obtained from iridectomy. At first we intended to confine our analysis of cases to those upon which scleral operations had been performed, but when we came to compare them with the results given by ordinary iridectomy the effect was so startling that we felt compelled to include iridectomy among modern operations, and indeed we might well have called our paper "The Vindication of Iridectomy."

We make this communication with diffidence because we are fully aware that in comparison with the enormous figures published by Elliot and others our numbers are very small. Still, the careful study of 160 cases operated upon quite independently in three institutions by two surgeons must have a certain if small value, and therefore we venture to bring our summary to your notice, hoping that it may at least elicit expressions of opinion from those whose larger experience renders their views of more value than our own. Our operations were performed at the Birmingham Eye Hospital, at the Coventry and the Leamington General Hospitals, and in our private practice.

We have operated for glaucoma upon about 1 in 500 of all our patients, which seems rather a small proportion. We have, however, never shown any undue anxiety to operate upon chronic glaucoma. Unless a decided hypertension were present, the cases have been treated with miotics, and only when expectant treatment has proved a failure, has operation been resorted to.

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*A communication to the Oxford Ophthalmological Congress, 10th July, 1914.

In every case of chronic glaucoma the fields have been carefully studied, and in doubtful examples the blind spot has been mapped out. Considerable use has been made of the Schiötz tonometer, both before and after operation. It has proved useful in measuring the tension of one eye against its fellow, and in cases where the results of palpation seemed doubtful.

The iridectomies and trephinings have been done by us both, all the "wedge" operations by one of us (J. J. E.), and all the "punchings" and "small flap" operations (with one exception) by the other (T. H. B.). Only one Lagrange has been performed, and it is not included in our analysis. We have excluded examples of absolute glaucoma which were operated upon for the relief of tension and pain, and have not included cases complicated by fundus disease. When the tension has been reduced to normal and and has remained normal, the case has been classed "good" in the tension column. Occasionally the tension has continued "full," but the field and acuity have remained good for over a year. We have classed these also as "good." If the tension has remained "full," and the function of the organ has deteriorated, we have placed "bad" under the head of tension. Where the visual acuity has been improved or has remained for a long time at its previous level, we have classed the vision as "good."

We have not observed ophthalmoscopically any filling up of a cupped disc after a successful operation, but we are exhibiting a section of a nerve-head which shews no signs of excavation, rather the reverse. The patient had a well-marked cupped disc before the punching operation, which was followed by acute mania and death from exhaustion. This specimen is similar to those shewn by Holth at the Heidelberg Congresss in 1913, demonstrating flattening of the disc after punching operations.*

We now come to the consideration of the tabulated summary which is before you.

Statistics of Operations for Glaucoma.

ACUTE AND SUB-ACUTE GLAUCOMA.

Operation.	Number of Cases.	Vision Improved or Preserved.	Tension reduced to Normal.
Scleral Operations	42	32=76 per cent.	35=82 per cent.
Iridectomies	28	20=71 ,,	23=88 ,,
Total	70	52=74 ,,	58=83 ,,
CHRONIC GLAUCOMA.			
Iridectomies	30	25=83 per cent.	21=70 per cent.
Trephine	23	17=74 ,,	20=87 ,,
Herbert's Wedge	15	11=73 ,,	12=80 ,,
Holth's Punch	18	13=72 ,,	14=77 ,,
Small Flap	5	2=40 ,,	2=40 ,,
Total	91	68=75 ,,	69=75 ,,
ALL GLAUCOMAS.			
Total	161	120=74 ,,	127=78 ,,

The most striking discovery we made when we had calculated the percentages was that in chronic glaucoma iridectomy headed the list of visual results. This superiority was unexpected, and is the more remarkable if we consider that nearly all the iridectomies for the relief of chronic glaucoma were performed in the first three years of the period of seven over which our cases have extended. We have written for some of these old patients, and have been surprised to find how frequently vision has been well maintained, fields have remained full, and tension has continued normal.

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* For abstract see THE OPHTHALMOSCOPE.

We would in this connection observe that in nearly all our "wedge" operations a basal iridectomy has been added to the scleral isolation. Very little apparent filtration follows the "wedge" operation, and the question suggests itself:—Is not the high position occupied in our tables by the wedge method largely due to the basal iridectomy? We are inclined to think that it is. Our opinion is confirmed by the study of several cases in which the aperture made by punch or trephine has firmly healed up. In some of these the presence of a basal or complete iridectomy has made the operation a success. Similar cases in which no iridectomy was performed have shewn signs of recurrent glaucoma as soon as filtration ceased.

These facts lead us to the conclusion that *an iridectomy should always be added to a sclerectomy.*

There are other advantages in a supplementary iridectomy. An intact iris is very liable to block the scleral aperture, whereas after iridectomy, the scleral canal may become lined by pigment cells and form a permanent "iris-fistula." This fact has been proved by Holth, who shewed sections of iris-fistulæ at Heidelberg.

The second fact we note is the general success of all the operations. Allowing for the fact that many of our cases have been observed only for a short time, it would appear that the disease is arrested, we will not say cured, in, say, 60 per cent. of the cases submitted to operation. Our actual figure is over 75 per cent., but time will probably shew that this estimate is too high. In any case the effect of operation is far more hopeful than we had anticipated. Thirdly, we were astonished to find that the results obtained in chronic glaucoma compared very favourably with those in the acute and sub-acute variety. This again is contrary to the accepted idea and to our expectation. It is especially in the vision column that acute glaucoma is disappointing. This is probably due to the fact that a large number of the cases come up for treatment too late for much vision to be regained.

The small-flap operation (Herbert) has yielded very poor results, so bad, indeed, that we gave it up after a very few trials. We found that if neatly performed, the incisions healed up perfectly, and no filtration resulted.

Our statistics show that the effect of the wedge-isolation method (Herbert) of trephining (Fergus-Elliot), and of Holth's punch operation, is practically equal. It is therefore open to the operator to practise whichever he finds easiest. One of us (T. H. B.) generally punches, the other (J. J. E.) move frequently practises wedge-isolation or trephining.

In acute glaucoma, with a reasonable depth of anterior chamber, iridectomy seems still to be as satisfactory as any other method. It is perhaps the most satisfactory operation.

As regards scleral operations, we have had little trouble with quiet iritis. It has not with us been more frequent than after iridectomy and when an iridectomy, accompanies the sclerectomy, iritis gives no trouble. We frequently instil a drop of atropine at the first dressing, forty-eight hours after the operation.

We have had cases in which apparent free filtration has been associated with no lowering of tension, and we would ask whether conjunctival œdema can always be accepted as a proof of filtration. We are convinced that pitting to a probe, Elliot's test, is no evidence of filtration. It can be seen in normal eyes upon which no operation has been performed, and is well marked near the practically invisible scar of a cataract section.

Some of our cases have shown dangerously large blebs over the aperture, and we have noted two cases which might be regarded as examples of late infection. In one of these there was no bleb, but, as the patient had had iritis before the operation, the severe iridocyclitis which followed a wasp sting on the eyelid six months after a successful operation, may not have been due to a late infection, but only to a recrudescence of a dormant iritis.

Discussion.

W. B. Marple, of New York, asked whether the favourable results which had followed iridectomy were those in which the scar showed signs of filtration. The authors said that in the majority of cases the scars were invisible, and there was no evidence of filtration.

A. Greene, of Norwich, stated that he had performed Holth's "punching" operation with success, but eventually he had a case of late infection which destroyed the eye.

Lt.-Col. Henry Smith, of Amritsar, was not altogether satisfied with the results of trephining, and he thought that there was still much to be said for iridectomy in chronic glaucoma.

J. O. McReynolds, of Dallas, Texas, cited a case of severe sympathic ophthalmitis which had followed a technically perfect trephining operation upon the other eye, an operation which had not been associated with iritis. Ultimately, the inflammation yielded to large doses of salicylates.

A. J. Ballantyne, of Glasgow, asked whether, in speaking of the Fergus-Elliot operation, the readers referred to two distinct methods.—The answer was in the negative. The writers recognised both surgeons as jointly responsible for the procedure.

G. H. Pooley, of Sheffield, regarded pitting as a sign of filtration. The authors stated that they did not consider that the amount of œdema was a measure of the volume of filtration. Cases with large blebs often did not really filter much, whereas in some cases the reduction of tension was marked, although there was little or no external evidence of filtration.

R. Beatson Hird, of Birmingham, pointed out that in cases where the iris was atrophic, iridectomy was useless, and here the newer operations were indicated.

P. J. Hay, of Sheffield, said that the conjunctiva was sometimes so thin that it afforded no adequate protection, and in these cases it was unwise to try to get a permanent fistula.

J. Gray Clegg, of Manchester, mentioned a case in his practice in which panophthalmitis had set in one-and-a-half years after trephining. He had had trouble with quiet iritis, and with cases in which the anterior chamber had remained shallow.

DELAYED HEALING OF THE WOUND IN CATARACT EXTRACTION AND ITS PROPER TREATMENT.*

BY

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IT is a source of much satisfaction to the surgeon when he removes the first dressing twenty-four, forty-eight, or seventy-two hours after operation for cataract, to find the cornea clear, the pupil black, and the anterior chamber fully re-formed. He will cautiously open the eye to explore the lower third or half of the cornea, and with oblique illumination will study the anterior chamber. If he finds it re-established, he is content to close the eye and to redress it without inspecting the wound, for he knows that the refilled chamber is a guarantee that there is perfect wound co-aptation and that primary healing is established. He forthwith allows his patient much more freedom, and speaks and acts with such cheer-inspiring confidence that the patient feels the burden of worry and fear roll away, and happiness and confidence in their places.

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* Read before the Section on Ophthalmology of the Ohio State Medical Society at its Annual Meeting at Columbus, Ohio, May 9th, 1914.

But should the operator find the iris flush with the cornea, the rotundity of the eye, as outlined by the convexity of the overlying upper lid, flattened, he will close the eye with some feelings of apprehension. He will then patiently wait for two days before another inspection, in the meantime keeping the patient quiet in bed with both eyes lightly covered, to avoid pressure, and if he finds the same picture, absence of the aqueous chamber, pallor of the conjunctiva, and lack of full rotundity of the eyeball, he will pass through another and deeper degree of apprehension. He will then consult his books and gather hope and courage from the writings of others, who, without full justification, have said the symptom is not to be dreaded, and that these eyes finally heal and with good result.

After a week of waiting, and finding no disposition on the part of the chamber to refill, he then inspects the wound, after cocainizing the eye, in search of tags of capsule or iris that mayhap lie in the wound, for the books teach that the common cause is to be found in shreds of tissue, fibrin, clot, iris, or capsule shreds, etc., which prevent reunion of the lips of the incision. Too often he will find nothing of the sort, and so after some gentle toileting and perhaps a little stimulation by means of a cotton swab dipped in some slightly irritating medicament, he will return the patient to his bed to await events. This sort of thing may go on for a tiresome period of time, fourteen days, eighteen days, twenty-one days, twenty-eight days, and in a case I know of, forty-nine days, during all of which time the eye looks pretty much the same as it looked when the operation was just finished.

Now what is the cause of this aggravating and anxiety-breeding nuisance?

In discussing the theories as to cause, we have to consider the three general kinds of sections that are made in the cataract operation, for delayed healing occurs in each :

First, the conjunctival flap incision.
Second, the incision of the limbus.
Third, the purely corneal incision.

Cause of tardy closure of the wound in conjunctival flap incision :

H. Herbert states (*see* "The Cataract Operation," page 153) : "Gaping of the sclero-corneal section can be taken as evidence that the conjunctival flap is too large," and again (*l.c.*, page 152), "The flap adheres quite early to the underlying tissue by means of blood clot and fibrin. The aqueous, being then retained by the elastic conjunctival covering, stretches and elevates the flap and forces the sclero-corneal surfaces asunder," and again (page 153), "The gaping of the central portion may be considerable a millimeter or more, approximation of the surfaces may never be complete, and a filtering cicatrix results."

Shreds of capsule, tags of iris tissue, hernia of iris and vitreous, masses of lens matter and clots in the wound may predispose the wound to gaping and cause delayed healing. These tags, shreds, clots, etc., are more apt to be present when a flap of conjunctiva is made, than when the section is purely corneal. This is obvious when we consider that the corneal section is bloodless, is exposed to inspection, and is easily toiletted. Whatever may be said in favour of the flap incision, the cystoid scar stands against it, and whatever may be said against the corneal incision, the absence of the cystoid scar stands for it.

Cause of tardy closure of the wound in limbus and purely corneal sections:

The leading authorities seem to agree on the following causes:

Shreds of capsule, tags of iris, strings of fibrin, lens masses in the wound, uneven or ragged section, entropion, and inherent weakness of the tissues, producing failure to react. This last cause has been ascribed by Mellinger to the unduly free use of cocaine.

A cause for retarded filling of the aqueous chamber common to both forms of section was first mentioned by Knapp in 1868 and elaborated by Fuchs in 1901, but does not concern the subject of this paper, since the wound goes on to healing, in spite of the fact that the aqueous chamber is empty. I refer to detachment of the choroid, following the operation. Because of the seeming fact that this occurs only after an iridectomy, it is thought that there is produced a small rent in the annular ligament, or in other words, a cyclodialysis due to the iridectomy being carried too far to the periphery, or to strain and detachment of this ligament by undue pressure in the effort of expression of the lens. An aqueduct is thus produced to allow passage for a few days to the space between the choroid and the sclera, thereby detaching the former. The detachment is usually in the outer half of the choroid, extending from the ora serrata back to the exit of the vorticose veins. It is of no clinical importance, it seems, for healing of the laceration invariably occurs, and when it does occur, the aqueous chamber is forthwith re-established.

I have consulted over a dozen text-books by the best modern writers and the above theories about cover the ground.

There remains, however, the stubborn fact that the anterior chamber will reform, and reform promptly, when the wound is forced apart with iris hernia, vitreous hernia, lens masses, shreds of tissue, and also when spastic entropion exists. We all know this. I have had case after case where each of these conditions was present, and there was no delay in the chamber re-forming.

There must be another cause for delayed closure of the wound and prolonged evacuation of the aqueous chamber.

I am prepared to believe that the real cause is an involuntary spastic contraction of the orbicularis palpebrarum muscle, or a localized convulsive "tic" affecting this muscle, which by its alternate contraction and relaxation presses the convexity of the cornea, thus flattening it to a certain extent, and causing the aqueous to spurt through the wound in little gushes. At least in a case which follows, my first case reported, I discovered the entire process by actual seeing, and verified the observation by prompt cure, following tenotomy of the orbicularis muscle.

No author that I know of has reported this as a cause for delayed healing of the cataract wound, and no author that I know of has proposed the remedy. Hence my temerity in bringing it to your attention on this occasion.

The forces at work to cause this delay in healing, in brief, are:—

First, absolute minus tension due to the nature of the operation and possibly local shock following it. Second, recumbent position, permitting the weight of the eyelids to fall sheer on the collapsed cornea. Third, involuntary winking, twitching movements to disturb union. Fourth, distinct spastic fibrillary and cramp-like contraction of the orbicularis palpebrarum muscle. And aided by, fifth, too frequent and meddlesome inspection.

The operation.

In order to remedy these conditions, I have devised the following operation: A drop or two of sterile cocaine, 4 per cent. solution, is injected upwards and downwards into the tissue above and below the external canthal ligament. A strong pair of sharp-edged, blunt-pointed scissors are used to sever the orbicular muscle from its attachment, *not outward in line with the palpebral fissure, but at right angles to it; viz.*, directly upwards and downwards. A moist antiseptic pad is applied. The bleeding is insignificant. This slight operation was not complained of by any of my patients. The three cases I had were promptly cured by this method.

I am familiar with Gifford's method of bandaging the unoperated eye and leaving the affected eye open behind a screen mask, and I have tried it in these cases without avail. I have, however, had success with it in some other tardy cases.

I shall report only the relevant *data* in the three following cases:

Cases.

Case 1.—Mr. G., aged 74. Right eye operated on by me on October 26th, 1913; a perfectly smooth operation; a garrulous patient and meddlesome with the dressings.

Twenty-six days after the operation I made the following entry in my case-book:

"He winks his eye eighty times a minute, actual count. The lids keep "milking" the eyeball and the cornea is massaged, producing a distinct wave, the summit of which rides ahead of the movement. Cornea clear; wound in perfect apposition and as nice and clean a cut as one would wish to see, but the aqueous spurts out of the wound. No watering of the eye; dressings are dry; aqueous evidently all passes down tear channel. No redness of the eye; gross vision good."

Performed up-and-down tenotomy of the orbicularis at the outer canthus without causing pain.

Next day the anterior chamber was normal. The wounds in the lid healed, leaving no deformity.

Case 2.—Mr. M., aged 74. Operated on by me for cataract on November 8th, 1913. Good incision, smooth extraction. Restless, troublesome patient.

Thirteen days after, no anterior chamber; wound in perfect apposition. Blinks incessantly, and makes strong pinching efforts with the eyelids; says his eye feels full and he squeezes the lids for comfort. The letting out of aqueous keeps the eye soft and comfortable. The next day I performed up-and-down tenotomy of orbicularis muscle at outer canthus, after which the anterior chamber promptly re-established itself. Healing of wound satisfactory and permanent.

Case 3.—Mr. McK., aged 77. Right eye operated on by me, November 17th, 1913. Smooth operation, good incision. Patient quiet and well-behaved.

Twelfth day after operation no sign of anterior chamber. Brought to operating room for examination of wound. Found small crack at summit of corneal wound, through which aqueous was escaping at every wink in little gushes.

No tags, shreds, or incarcerations. Performed tenotomy upper and lower orbicularis at outer canthus.

On the next day had nice, deep chamber, and said he saw better. Healing went on rapidly and perfectly.

Final statement.

There may be other factors than the one I have claimed as a cause for delayed healing of the wound, but if after ten days' waiting, the eye is cocained and the wound scrutinised with a Zeiss or Berger *loupe*, and if aqueous is escaping, I would recommend that this operation for its cure be performed, and, furthermore (but without cases to back my assertion) I would suggest to those who operate with conjunctival flap (I do not) that when they see the evidence of cystoid scar beginning to form, this small operation be done, for it produces no deformity, causes no pain, does no harm, sets aside the possibility of spasm-pressure on the eyeball, and, lastly, may save much anxiety and vexation.

TRANSLATION.

THE TREATMENT BY RADIUM OF AN EPITHELIOMA OF THE NOSE IN A MAN, EIGHTY YEARS OF AGE. CURE.*

BY

DR. TH. NOGIER,

OF LYONS, FRANCE.

AFTER describing the case, photographs of which are given in the original, **Nogier** goes on as follows :

Treatment.—After having photographed the patient, we proceed to remove with forceps the crusts which cover the lesions, and to sponge away the small quantity of pus found underneath. The floor of the wound is covered with granulations, which bleed on the slightest provocation. The bleeding is stopped with aristol powder.

Next, we fix on the nose a tin plate (*cache en étain*), one millimetre thick, and of the same shape and size as the lesion. This plaque is covered underneath with a layer of leucoplast, in order to avoid the harmful action of secondary rays.

We now bring to bear over the whole lesion our apparatus, *à sel collé*, No. 6 size, 20 mm. by 30 mm., which filters the rays through two-tenths of a millimetre of aluminium in such a way as to employ only the hard β rays and the γ rays. The dose given was one of 107·8 milligramme hour.

The patient was then dismissed, and told simply to keep the wound clean by washing it with a solution of phenosalyl.

The reaction was pretty severe for a fortnight. There was no pain, but very marked tingling. The formation of pus rapidly ceased.

A month after the treatment, the wound was completely cicatrised, and the epithelioma was cured. There was not even redness. . . . . At the end

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*Abridged translation of an article in *La Clinique Ophtalmologique*, 10 mai, 1914. "Traitement par le radium d'un épithélioma du nez chez un vieillard de 80 ans. Guérison."

of December, 1913, we saw the patient again. The cicatrisation of the lesion was perfect. The skin was quite supple, smooth, and of good appearance. No peripheral irritation. It was hardly possible to trace the site of the lesion.

The following three important remarks may be allowed to follow this communication :—

(1) *The treatment by radium is not by any means analogous to treatment by X rays.*

Whether one employs the α rays, the β rays, or the γ rays of radium, such rays are not given out by a Crookes' tube.

The α rays are analogous to the *Kanalstrahlen* of Goldstein, but these do not come out from a Crookes' tube.

The β rays are analogous to the cathodal rays, although they are much more penetrating than the latter. One knows, however, that these cathodal rays are not utilised.

As to the γ rays, which are analogous to the X-rays, they are much more penetrating than the last-named. There again the radiation of radium is quite different from that of the Crookes' tube. It may be said with truth that the γ rays "can be compared with the X-rays of a tube which is *infinitely hard*." A tabular comparison will render the contrast more striking.

RADIUM RAYS.		RAYS OF CROOKES' TUBE.	
α Rays	Traverse from 3-4/100 mm. of aluminium. *Usable.*	Canal Rays	Very slightly penetrating. Do not emerge from the tube. *Unusable.*
β Rays	Traverse up to 5 mm. of aluminium. *Usable.*	Cathodal Rays	Hardly traverse a few thousands of a mm. of aluminium. Do not emerge from the tube. *Unusable.*
γ Rays	Traverse up to 10 cms. of lead (enormous penetration). *Usable.*	X-Rays	Practically stopped by 2-3 mm. of lead. *Usable.*

Radium therapy thus allows of the obtaining of results which radio-therapy cannot give.

(2) *All epitheliomata of the skin are not cured by radium therapy so well as by radiotherapy.*

This depends upon their nature. The researches which Dr. Regaud and myself have carried out for several years very well show the histological secret of this difference in the results obtained.

If the epithelioma is *baso-cellular*, even if extensive and rugged, it will quickly be cured and will not recur.

If the epithelioma is *spino-cellular*, even although very small, it may improve, but, after a period of reduction, it will soon progress again. Definite cure will not be obtained.

(3) *In deeply-seated neoplasms the most certain method of treatment* (*when the case is inoperable*) *is not radium alone, but the combination of radium with radiothérapie intensive filtree.*

In such a severe disease as cancer, one must bear in mind that the lesion which is perceptible to touch is not the only lesion which exists. The lymphatics are already choked with neoplastic cells far from the lesion itself. It is therefore necessary not only to attack the lesion itself by means of radium *loco dolenti*, but also widely to irradiate the neighbourhood by means of X-rays of high penetrating power. This method, which has been applied systematically in several foreign towns, especially at Freiburg in Breisgau by Gauss, Krönig and Lembke, has given a remarkable percentage of cures in the case of histologically characteristic neoplasms of the neck of the uterus.

ERNEST THOMSON.

THE OXFORD OPHTHALMOLOGICAL CONGRESS, 1914.

The Oxford Ophthalmological Congress met on July 9th and 10th last at Oxford, under the mastership of Mr. R. W. Doyne. As usual, Keble College was the social headquarters, while the scientific work of the Congress was carried on in the Department of Human Anatomy of the University, kindly lent for the purpose by Professor Arthur Thomson.

The meeting, favoured by genial weather, was successful from every point of view. The attendance was above the average. France was worthily represented by Dr. Darier, of Paris, Switzerland by Dr. Verrey-Westhal, of Lausanne, and Canada by Dr. R. A. Reeve, of Toronto, while, as now usual at these meetings, America was well to the fore, and sent Dr. Wendell Reber, Dr. Casey A. Wood, Dr. W. B. Marple, Dr. W. H. Snyder, Dr. J. O. McReynolds, and Dr. H. Gifford, to mention some only of those who were present.

The discussion this year dealt with the very important subject of workmen's compensation in injuries of the eye, and was opened by Dr. William Robinson (Sunderland), Dr. Frank Shufflebotham (Newcastle-under-Lyme) and Mr. Angus MacNab (London). Among those who took part were Mr J. Jameson Evans (Birmingham), Dr. Gray Clegg (Manchester), Mr. G. H. Pooley (Sheffield), and Mr. R. J. Coulter (Newport).

A most interesting lecture-demonstration was that by Dr. Casey A. Wood (Chicago), in which he described his lengthened observations upon the eye of the common sparrow (*Passer domesticus*). Mr. S. H. Browning (London) described a new biological test for the recognition of sympathetic ophthalmitis, and spoke of his experiences with salvarsan and neosalvarsan in the treatment of that redoubtable affection. Mr. W. M. Beaumont (Bath) read a scholarly paper upon the evolution of so-called "toxæmic iritis." Mr. G. M. Harston (Hong Kong) described his successful and rapid treatment of trachoma by means of carbon dioxide snow. Dr. Darier spoke of emergencies in ophthalmic therapeutics, laying great stress upon the paraspecific or collateral action of serums generally; and Mr. R. W. Doyne, of the reaction of the pupil under various kinds of illumination and also of the movements of the eye in reading.

On the second day of the Congress, the chair was taken by Dr. R. A. Reeve, of Toronto, and the proceedings opened with an able paper by Dr. Wendell Reber (Philadelphia) on the present status of the heterophoria question. He concluded that esophoria was wholly amenable to the careful correction of refraction, while exophoria required training of the muscles, prisms, or operation. Hyperphoria usually called for correction by prisms. Mr. G. H. Pooley (Sheffield) described a simple and efficient way of rendering the eyeball anæsthetic by injecting a solution of alypin and adrenaline into the short and long ciliary nerves behind the eyeball. He had employed the new method successfully in forty-seven intra-ocular operations. Messrs. J. Jameson Evans (Birmingham), and T. Harrison Butler (Leamington Spa), concluded as the result of an analysis of their operative results during the last seven years, that the final results in chronic glaucoma were better with iridectomy than with the newer operations. The paper was fully discussed, and the opinion of the meeting seemed to be that the modern operations were by no means as satisfactory as some would have us believe, while it was obvious that late infection was a serious menace to the future of an eye with a permanent fistula. Lieut.-Col. Henry Smith's communication upon the treatment of incipient cataract by means of subconjunctival injections of mercury cyanide, led to a good discussion. He was received very warmly by the Congress. The last paper was by Mr. Sydney Stephenson (London), and dealt with the discovery of the bacillus of bovine tuberculosis in cases of phlyctenular disease. Of the twenty cases tested, all had reacted to bovine serum. The speaker dwelt upon the connection between phlyctenulosis, on the one hand, and tuberculosis, on the other, and in this he was supported by several of the members who took part in the discussion.

The official dinner was held in Keble Hall, under the presidency of Professor Arthur Thomson. Among the speakers were Professor Wm. Osler, the Warden of Keble College, Mr. W. H. H. Jessop, and others.

On the evening of July 9th, the following resolution, brought forward by the Council, was proposed by Mr. E. Treacher Collins (London), and seconded by Dr. Casey A. Wood (Chicago): "That the Council recommend that an Ophthalmological Congress should continue to be held annually out of London, and that the Ophthalmological Society should be approached to see if arrangements can be made for the carrying on of these extra-Metropolitan meetings in addition to its annual London meeting." It excited considerable opposition, and after full discussion, was finally withdrawn

An enjoyable meeting was brought to an end by a garden party in Trinity College gardens, followed by a smoking concert in Keble College.

CURRENT LITERATURE.

NOTE.—Communications of which the titles only are given either contain nothing new or else do not lend themselves to abstract.

I.—ANATOMY AND PHYSIOLOGY.

(1) **Hess, C.—Individual differences of the normal ciliary body: a contribution to the study of glaucoma.** *Archives of Ophthalmology*, January, 1911.

(2) **Behr, C.—On the lymph channels and circulation in the optic nerve. (Ueber Lymphbahnen und Saftströmung im Optikus.)** *Zeitschrift für Augenheilkunde*, Heidelberg, 1911.

(3) **Krauss, W.—On the smooth muscles of the human orbit. (Ueber die glatten Muskeln der menschlichen Orbita.)**

(4) **Sattler.—On the so-called Landström's muscle and its significance in the exophthalmos of Basedow's disease. (Ueber den sogenannanten Landströmschen Muskel und seine Bedeutung für den Exophthalmos bei Morbus Basedowii.)** *Bericht der Ophthalmologischen Gesellschaft*, Heidelberg, 1911.

(5) **Münch, Karl.—The mechanism of the movement of the iris. (Zur Mechanik der Irisbewegung.)** *Klin. Montsbl. f. Augenheilk.*, April, 1912.

(6) **Simpson, Sutherland.—The physiology of the hypophysis cerebri.** *Ophthalmology*, July, 1913.

(7) **Elschnig.—Upon the anatomy of the human albinotic eye. (Zur Anatomie des albinotischen Menschenauges.)** *Bericht der Ophthalmologischen Gesellschaft*, Heidelberg, 1913, S. 1

(8) **Clapp, C. A.—A communication upon the weight of infants' lenses and their solids.** *Archives of Ophthalmology*, November, 1913.

(9) **Magitot A., and Mawas, J.—The cells of the vitreous body of the human eye: their origin, signification, and physiolological rôle in the formation of the intra-ocular fluids. (Les cellules du corps vitré de l'oeil humain. Leur origine, leur signification et leur rôle dans la formation des liquides intraoculaires.)** *Ann. d'Oculistique*, novembre, 1913.

(1) **Hess**, of Munich, does not here deal with the glaucoma problem, but calls attention to certain normal appearances of the ciliary body which may have a bearing on the problem and may later help to elucidate it.

In the infant, the ciliary processes are narrow thin bands fairly far apart, with flat irregular folds visible between them. The surface of the processes is uniformly pigmented, and a considerable space separates their apices from the margin of the lens. In the eye of an 80-year-old man, the processes were found thicker and plumper, often thickened, like clubs, towards the lens; the spaces between the folds were much smaller, the folds themselves white, irregular, broader, and studded with bulbous outgrowths. Their distance from the lens is much less than in the infant, the processes reaching in many cases to the equator. These bulbous outgrowths develop on the summits of the ciliary processes, partly between the ages of 30 and 40, perhaps still earlier, and then increase in size, more or less rapidly, causing in different normal eyes, a very different increase in volume. They are more common in old age than in youth, but by no means uniformly so, for they may be almost totally absent at the age of 67, of which a case is reported. The size of these formations is independent of the size of the ciliary *muscle*. Microscopical examination showed that the white colour of the summits is really caused *not* by loss of pigment, but by the deposit of newly-formed whitish masses over the pigmented layer. In normal eyes, the ciliary summits, in middle and old age, may be either distant from the equator of the lens, or pressed closely upon it, so that they seem to touch the anterior surface of the lens. Where the bulbous outgrowths are more strongly developed, they demonstrably press forward the iris in a greater or smaller number of places, and this with the physiological thickening of the iris occurring with age, makes the anterior chamber narrow at the periphery, and then, *even with normal circulation*, any change in the width of the pupil may lead to occlusion of the filtration angle.

ROSA FORD.

(2) **Behr**, of Kiel, as is well known, has for some time carried out a series of researches upon the nature of optic neuritis, and upon the lymph circulation in the optic nerve. He showed before the Heidelberg Congress a series of preparations, the results of injections of Berlin blue into the optic nerve. The preparations, which he believed to be injections of true lymph spaces, and not mere artificial percolation of the mass into the tissues of the nerve

showed that there is no direct communication between the perivascular spaces of the central vessels and of their branches in the retina and the neighbouring lymph spaces in the retina; that the sole communication between the perivascular lymph spaces of the central vein with the central and neighbouring parenchymatous lymph spaces of the nerve, just before the exit of the vessels, is much larger than the communication with the interneural sheaths, and should have much greater value as regards the outflow of fluid from the perivascular spaces; that there is also a communication of the essential parenchymatous lymph spaces of the nerves with the interneural sheath (*zwischenscheidenraum*) by way of the pial sheath; and, finally, that the suprachoroidal and subdural portion of the interneural sheath can be exclusively injected if the injection be carefully performed.

T. HARRISON BUTLER.

(3 and 4) Landström, in 1907, published a paper describing a ring of smooth muscle fibres which surrounds the anterior part of the globe, arising from the septum orbitale and passing backwards to be inserted into the equator of the globe. Both **Krauss,** of Marburg, and **Sattler,** of Leipzig, deny the existence of such a well-defined ring of muscles, but both admit that smooth muscle is to be found in the situation described by Landström, although not arranged in a regular ring-shaped membrane. It is, as Landström states, more fully developed on the nasal side than on the temporal. These muscular bundles take origin at the equator of the globe from the connective tissue which forms the fascia of the internal rectus, and following its tendon, passes into the episcleral and subconjunctival tissue. The muscle bundles can be followed to the fornix but are lost there. Other fibres above and below the tendon arise from Tenon's capsule and take the same course to the fornix. Hardly any fibres can be found on the outside associated with the external rectus. The few that are present are more frequent above this muscle and run forwards to the fornix. Above the tendon of the levator palpebræ superioris no smooth muscles can be found, but below it there is the well-known Müller's muscle.

(5) **Münch**, of Göppingen, replies to the paper by Hesse in which the latter disputes the opinion of Münch, that the static condition of the iris (that is, when all muscular influences are in abeyance) is indicated by a moderate miosis, and concludes from a case of his own that the removal of muscular influences causes mydriasis. The real point in dispute is the statement made by Münch, eight years ago, that the stroma cells of the iris are muscular in their nature, and that they constitute the dilator mechanism of the iris. Although the view of Münch has not been universally accepted, it appears to have the support of many acknowledged authorities, and Münch says he still adheres to the belief in the muscular nature of the iris stroma cells, in which transverse striation, fibrillary striation, splitting of the cells into fibril bundles, and typical muscular nerve endings, have been demonstrated. He thinks that Hesse's view is not borne out by the facts of his case, and points to the state of the pupil after death, miosis setting in after the cessation of rigor mortis, in support of his own view.

A. J. BALLANTYNE.

(6) **Simpson's** article forms a useful review of the present position of our knowledge regarding the pituitary body, and may be briefly summarised:

Anatomy.—In man, monkeys, and some other mammals, the body and neck of the gland are solid, and the pars nervosa is only partially surrounded by the epithelial portion. The latter is divided into the pars anterior, which forms the anterior lobe, and the pars intermedia, which forms part of the posterior lobe. The pars anterior consists of epithelial cells arranged in columns, between which are the blood channels. The pars intermedia is composed of finely granular epithelial cells arranged in layers closely applied to the pars nervosa. The latter consists of neuroglia and ependymal cells. Colloid material produced by the cells of the pars intermedia passes through the pars nervosa into the third ventricle, where it mingles with the cerebro-spinal fluid. The pituitary may therefore be said to have an external secretion from the pars intermedia into the third ventricle, and an internal secretion from the pars anterior into the blood.

Functions of the posterior lobe.—Extracts of the posterior lobe stimulate plain muscle in the walls of blood vessels, in the uterus, intestine, and elsewhere, produce dilitation of renal blood vessels and stimulation of the renal cells, and excite the secretion of the mammary gland. How many hormones take part in these effects is not known.

Functions of the anterior lobe.—Extracts of the anterior lobe are physiologically inactive. Experimental extirpation of the anterior lobe usually causes death. Partial removal leads to nutritional changes in the skin and its appendages, disturbances in carbohydrate metabolism, body temperature, growth and renal function, mental dulness or irritability, sexual inactivity or atrophy of the reproductive glands, and microscopic changes in the other ductless glands. More light has been thrown on the functions of the anterior lobe by cases of diseases, *e.g.*, acromegaly, of which changes in the the anterior lobe are supposed to be the cause. Generally, this disease is supposed to be due to functional overactivity of the anterior lobe, the assumption being that this part normally produces a secretion which promotes the growth of the skeleton and soft tissues. The group of symptoms known as "dystrophia adiposo-genitalis" is associated with tumour of the hypophysis and on the same ground would be considered the result of hypopituitarism, a view supported by the results of Cushing's partial removal experiments.

It is known that functional and anatomical changes in the pituitary lead to changes in the thyroid, suprarenal, and reproductive glands, but the significance of these relationships is not yet understood. A. J. BALLANTYNE.

(7) **Elschnig**, of Prague, has carefully examined the eye of an albino girl. He found no dark pigment in the retinal layer of the iris, but only fine bright-brown pigment grains, with a few large homogeneous brown drop-like bodies. There was a little more pigment in the sphincter region and in the ciliary body. The light-brown granules are more numerous in the neighbourhood of the macula. There was no trace of any needle form pigment. Traces of pigment are present only in the retinal layers of the eye, but the pigment is essentially different from that found in the normal eye. No fovea centralis could be detected in this eye. Elschnig draws attention to the fact that Fritsch found no fovea in the eye of an albinotic Herero, and also states that the most minute ophthalmoscopic examination of six albinos failed to detect any fovea centralis. The fovea develops late in foetal life, so its absence in albinos may be taken as evidence of incomplete development. The absence of a definite macula would account for the nystagmus which is associated with albinism. T. HARRISON BUTLER.

(8) **Clapp**, of Baltimore, has examined the lenses of twenty children of an average age of six weeks, the majority of them being from three to four weeks old, and the ages varying from two weeks to five months. The lenses were removed in the capsule from one to twenty-four hours after death and weighed immediately. They were then placed in the vacuum desiccator and weighed at intervals until the weight became constant, which sometimes occurred only after weeks of drying. Clapp found that the average weight of a lens was 0·0953 gm. (as opposed to Becker's 0.1 gm. at birth), the average weight of

solids was 0·0265 gm. and the average percentage of solids 27·57. He concludes that the weight of infant lenses is subject to comparatively wide variation, but, on the whole, is somewhat less than that usually given, and the percentage of solids is less than that for an adult, which is given by Priestley Smith and Treacher Collins as 29 per cent.

ROSA FORD.

(9) **Magitot** and **Mawas**, of Paris, reiterate the opinion expressed by them in a previous article as to the predominant part played by the neuroglial cells in the formation of the vitreous, both solid and fluid. The fibrils and, above all, the liquid which permeates them are derived to a large extent from the tissue which has recently been described under the name of the glial sheath of the hyaloid vessels. The cells of this sheath are endowed with a remarkable polymorphism. Some of them become hairy (*cheveues*) cells like the neuroglial elements of the nervous centres and their prolongations form the fibrils of the temporary vitreous. Others become free and after detaching themselves from the common matrix, become round and develop in their protoplasm grains of secretion which become confluent, and finally transform the cell into a large vesicle, which ends by bursting and discharging its contents.

The liquid which causes the first appearance of the anterior chamber is identical in origin with that which gives rise to the interlenticular-retinal cleavage of the mesoderm. The cells which form it reach the anterior face of the lens by following the ramifications of the lental vessels. As in the vitreous cells are seen sprouting from the external wall of the vesicular endothelium. In the third month these cells are only slightly vesicular and their protoplasm becomes dissociated after having sent out some prolongations. This splitting up of the protoplasm explains the extremely albuminous nature of the aqueous at this period. Vacuolisation appears in the fourth month and reaches its apogee in the fifth month, when the anterior chamber attains its greatest amplitude.

The ectodermic origin of these cells is shown by the resemblance of the process to that which takes place in the vitreous near the papilla, and by the neuroglial nature of the hyaloid sheath which has its origin in the optic nerve. This sheath is at first separated from the artery at the level of the future papilla but rapidly becomes joined to it. Instead of ending after a very short course, the cells which constitute it become fine and creep along all the ramifications of the vessel until they reach the anterior face of the lens where the fenestration of the pupillary membrane allows them to penetrate into the anterior chamber.

The authors therefore conclude that the vitreous fluid and the aqueous humour are of identical origin, at least during the development of the eye.

R. J. COULTER.

II,—OPHTHALMOLOGY AND GENERAL MEDICINE.

(*Third Notice.*)

(1) **Veasey, C. A.—A case of cerebello-pontine tumor, diagnosed and located three years before death.** *Ophthalmic Record*, March, 1913.

(2) **Traquair, H. M.—A case of paresis of the fourth nerve, following herpes zoster ophthalmicus, complicated by a pre-existing heterophoria.** *Ophth. Rev.*, March, 1913.

(3) **Barkan, H.—Herpes iris of the conjunctiva, with report of a case.** *Archives of Ophthalmology*, May, 1913.

(4) **Fejér, Julius.—Suppurative endophthalmitis after pneumonia. (Endophthalmitis suppurativa nach Pneumonie.)** *Centralbl. f. prak. Augenheilkunde*, Juni, 1913.

(5) **Fernandez, Santos.—Amaurosis from optic neuritis in the course of measles. (Amaurosis por neuritis optica en el curso del sarampion.)** *Arch. de Oftal. Hisp.-Amer.*, Julio, 1913.

(6) **Garcia del Mazo.—Retrobulbar neuritis and paralysis of the sixth nerves following diphtheria. (Neuritis optica retrobulbar y paresis del VI par craneal, dobles, consecutivas a la difteria.)** *Arch. de Oftal. Hisp.-Amer.*, Julio, 1913.

(7) **Rusche, W.—A contribution to the relationship of infectious diseases to the organ of vision. (Ein Beitrag zu den Beziehungen der Infectionskrankheiten zum Sehorgan.)** *Zeitschrift für Augenheilkunde*, Juli, 1913.

(8) **Calhoun, F. Phinizy.—Report of a case of optic atrophy caused by uterine hæmorrhage.** *Ophthalmic Record*, July, 1913.

(9) **Ormond, A. W.**—A case of albuminuric retinitis of ten years' standing. *Transactions Ophthalmological Society U. K.*, Vol. XXXIII, 1913, p. 91.

(10) **Taylor, James and Holmes, Gordon M.—Two families with several members in each suffering from optic atrophy.** *Transactions Ophthalmological Society U.K.*, Vol. XXXIII, 1913.

(11) **Farnarier, F.—Two abnormal cases of paralysis of accommodation following latent diphtheria: the one with paralytic mydriasis, the other with paralysis of convergence. (Deux cas anormaux de paralysie de l'accommodation: l'un avec mydriasis paralytique, l'autre avec paralysie de la convergence, à la suite de diphtéries latentes.)** *La Clinique Ophtalmologique*, 10 septembre, 1913.

(12) **Pagenstecher, H. E.—Acute blindness in brain abscess. (Akute Erblindung bei Hirnabzess.)** *Archiv für Augenheilkunde*, November, 1913, S. 351.

(13) **Hoffmann, Michael.—Concerning disease of the ocular nerves in diabetes mellitus.** *Archives of Ophthalmology*, January, 1914. (Translated by Alfred Braun, New York.)

(14) **de Lavigerie, Duboys and Onfray, René.—Lymphoma of the eyelid. (Mycosis fungoides commencing with tumours, type Vidal-Brocq.) [Lymphome de la paupière (mycosis fungoïde à tumeurs d'emblée, type Vidal-Brocq).]** *Ann. d'Oculistique*, avril, 1914.

(1) **Veasey**, of Spokane, based his diagnosis of the presence of symptoms of intracranial pressure on the following localising symptoms:—right-sided deafness and tinnitus with dizziness and vertigo, right facial paresis, loss of function of the right fifth and sixth nerves, and sense of smell could not be elicited in the right naris.

The ocular symptoms, apart from double papillœdema and the oculo-motor symptoms mentioned, were nystagmus, marked on looking up and to the left, moderate contraction of the visual field, but no hemianopsia, and vision

reduced to 2/5 (right) and 1/4 (left). Pupil-reflexes were normal, and ciliary muscles were unaffected.
J. JAMESON EVANS.

(2) **Traquair's** patient had no diplopia or trouble in distant vision, but experienced difficulty in reading, especially by artificial light. By the Maddox rod, a right hyperphoria and esophoria were elicited. The trouble in near vision began about a month after an attack of herpes on the right side of the head. Relief was obtained by wearing the presbyopic correction with prisms. It is interesting to note that the patient's son had left hyperphoria with esophoria.
A. H. PAYAN DAWNAY.

(3) The patient reported by **Barkan**, of San Francisco, was observed at Fuch's Clinic at Vienna. In March, 1911, the patient had an attack of herpes iris affecting the skin and mucous membranes, including the conjunctivæ. All healed except the conjunctivæ, which continued to discharge until in June, 1911, the patient attended Fuch's Clinic. Here it was found that he had marked photophobia, with a profuse, thick, stringy conjunctival secretion. He was admitted, and then had an attack of erythema multiforme, which was very severe and involved the skin and mucous membranes, including the urethral. The conjunctival inflammation was of a virulent diphtheritic type, and ulceration of both corneæ ensued. At the time of leaving the Clinic, after several months' stay, there was secretion of glairy mucus, marked ciliary and conjunctival injection, corneal opacities, ankyloblepharon, symblepharon, and photophobia. All the other lesions healed completely.

Involvement of the eye in herpes iris is rare. When it does occur, it resembles, as a rule, a mild catarrhal conjunctivitis, although it sometimes takes on the form of a malignant inflammation affecting skin and mucous membrane, including that of the mouth, larynx, vulvo-vagina, and urethra, and accompanied by high temperature (as in the above case) and occasionally followed by death.
ROSA FORD.

(4) The case reported by **Fejér**, of Budapest, is that of a woman, aged 50 years, who during an attack of pneumonia developed an inflammation of one eye, which gradually came to present the picture of a suppurative panophthalmitis. As the illness was fatal, it was impossible to make any investigations as regards the causal organisms.
A. LEVY.

(5) Though external manifestations are amongst the commonest sequelæ of measles, a deeper lesion is extremely rare.

The present patient, a girl of seven, was brought to **Fernandez**, of Habana, with a history that she had been attacked by measles about three weeks before, and that on the disappearance of the rash, her vision was noticed to be very defective, so that in walking about the house, she came into collision with the furniture. The pupils were dilated, and the ophthalmoscope showed a white disc and an absence of the proper vessels. There was no œdema round the disc. Fernañdez diagnosed optic neuritis, and for the want of anything better, taking into consideration how often diphtheria is associated with measles, gave an injection of Roux's antidiphtheritic serum. This was repeated several times and within a few weeks, the vision returned to normal, although the appearance of the discs remained unchanged.

HAROLD GRIMSDALE.

(6) A case of this rare sequel to diphtheria. Recovery complete in about two months and a half.
HAROLD GRIMSDALE.

(7) **Rusche,** of Bremen, recounts two cases in which general infective disease was associated with ocular inflammation.

A child, who had recently recovered from scarlatina, developed slight optic neuritis, and another patient, aged 50 years, suffering from a mixed infection with streptococci, para-typhoid, and coli bacilli, which ended fatally, lost her eye from a severe cyclitis.

We cannot altogether follow Rusche when he suggests that ocular disease is a common complication of acute rheumatism of the joints (meaning rheumatic fever, because he mentions heart complications). T. HARRISON BUTLER.

(8) The patient whose case is reported by **Calhoun**, of Atlanta, Georgia, was a woman, aged 28 years, whose personal and family history were unexceptional, and who suffered from profuse uterine hæmorrage at the end of a period of menstruation. Severe collapse with loss of consciousness was followed by nausea, hiccough, and a temperature of 102° F. After ten days, when she recovered sufficiently to be able to sit up, she noticed that she was totally blind, being unable to detect the light in the room. This period of absolute blindness lasted three weeks, and then the sight returned slowly. Four months later, R.V. 20/50 to 15/200. Pupils and media normal, discs very pale with retinal anæmia, and vessels much contracted. The visual fields were much contracted and hemianopic in type—restriction being nasal in the right eye and inferior in the left. There was some interlacing of the colour fields as well. J. JAMESON EVANS.

(9) This case by **Ormond**, of London, is interesting since the patient (a woman, whose age is not stated) has been under observation since 1902 suffering from retinitis associated with kidney mischief. The retinal vessels show marked angio-sclerosis. Toxæmia has not been a marked feature of the case.

SYDNEY STEPHENSON.

(10) The careful and detailed investigation into these two families by **Taylor and Holmes**, of London, is profusely illustrated with charts of the fields and a pedigree table. Owing to the number of particulars about each, it is scarcely possible to do better for our readers than to give the authors' summary of the chief points of interest :—

1. The visual affection occurred only in males, but in each instance it was transmitted through the female.

2. In many of the cases the initial failure of vision was quite sudden and did not appear to progress after the first three or four weeks. In others the onset was slower and more gradual. There has not been any marked improvement of vision in any of the cases. In these respects our cases correspond to the ordinary history of Leber's atrophy.

3. It has been frequently emphasised, however, that in Leber's atrophy there is rarely any peripheral contraction of the field of vision, but this was present in several of our cases, and in two at least there was complete blindness of one eye.

4. In each branch of the affected families in which more than one member was affected, the younger members developed the symptoms at a younger age than the elder.

5. The occurrence of cataract in early life in one case and the death of another from an orbital tumour is noteworthy. Several members of the same family suffered from visual migraine, and it is interesting that in one member at least the migrainous subjective visual phenomena appeared in the blind portions of his field of vision after the blindness had set in.

6. Two sons of another branch of the family, through the female line, have visual disturbance of a character which we have been unable to identify with certainty, but it probably depends on some congenital defect.

ERNEST THOMSON.

(11) Both the cases reported by **Farnarier**, of Marseilles, are of much interest in as much as in both of them a paralysis, in the one case of the ciliary and sphincter pupillæ muscles, in the other of the ciliary and convergence muscles, followed an infection of the throat with the diphtheria organism (Löffler) without the patient having symptoms of diphtheria. In the first case

it is true that a contact could be traced, and the patient was indisposed for a single day, but in the second case no contact could be traced and there was no illness at all. Further, the first case forms an exception to the rule, a rule which is stated by many authorities to have such exceptions, that paralysis of the pupil sphincter is not associated with post-diphtheritic palsy of the ciliary muscle. The author considers that anomalies of the function of convergence, such as was observed in the second case, will be found more often than hitherto, if carefully looked for. The moral pointed by these two cases is that careful examination of the pharyngeal mucosa shôuld be undertaken in all obscure cases of paralysis of accommodation, even where there are no signs whatever pointing in the direction of diphtheria, and this, not only in the interest of the patient himself, from the point of view of serum treatment, but also in the interest of other people to whom he may become a "carrier" of dangerous micro-organisms. ERNEST THOMSON.

(12) In this article, **Pagenstecher**, of Strassburg, comments on the incompleteness of our knowledge of the destruction of the visual function in brain abscess.

In the "French Encyclopædia of Ophthalmology," Berger wrote about this subject in a somewhat detailed way. Pagenstecher wishes to report upon cases only with acute and entire or nearly complete blindness, which without other serious prodromal signs, may attack an apparently healthy individual, and cause him to consult the oculist. In 1897, Heinersdorff reported a case in which almost complete blindness occurred in the course of fourteen days. The pupils reacted promptly, although the vision of the patient was perception of light, and the fundi were normal. The patient died within a week, and the *post-mortem* examination showed symmetrical abscesses in the occipital lobes as the cause of the blindness.

Pagenstecher has had two such cases, which were later explained by the *post-mortem* findings :

Case 1.—The patient was said to have had good vision until eight days previously, when he was seized with a severe headache and vomiting. Vision diminished very rapidly, and at the time of examination, the patient gave one the impression of a suddenly blinded, stupefied person. The fundi were normal. Vision was equal to hand-movements. At the *post-mortem* examination, there was found in the right occipital lobe an abscess nearly the size of an egg.

Case 2.—The patient was in a sanatorium on account of a lung lesion. Fourteen days before he was seen, he complained of a severe pain through the head and neck. He noted a glistening before the eyes, which was very troublesome. His sight failed very rapidly, and he was brought to the eye clinic. The fundi were found to be normal ; vision was equal to perception of light. The *post-mortem* diagnosis was pulmonary tuberculosis, metastatic cerebral abscess, and suppurative meningitis. After the brain had been hardened and sections made, there were found almost symmetrical abscesses, in the region of which nearly the entire white matter of the occipital lobes was softened and spotted with hæmorrhages.

The writer goes on to discuss these cases in a general way, and says the explanation of the blindness is not very apparent in the first case, as with a one-sided egg-sized abscess in the right occipital lobe, one would have expected hemianopsia, and not nearly complete blindness. In the second case the blindness is explained by the presence of symmetrical abscesses in the region of both sight centres, which acted partly through destruction of the centres, and partly through interruption of the sight waves. The important symptom in each case was blindness, and the secondary symptoms were too insignificant for a diagnosis. In both, headache was complained of, with dizziness. In both cases, there was found metastatic abscess formation, which had its origin in disease of the lungs. HANFORD MCKEE.

(13) **Hoffmann,** of Munich, has examined the eyes of two diabetic subjects, *post-mortem*, and found large quantities of glycogen in the ocular nerves of both. With the occurrence of glycogen, there can be demonstrated lesions of the nerves, and especially of their medullary sheaths. Amongst the suggestions he makes is one that every opportunity should be taken of ascertaining whether similar findings occur regularly in diabetic eyes, especially under conditions of lipæmia or coma. R. H. ELLIOT.

(14) **Duboys de Lavigerie** and **René Onfray**, of Paris, record a case of mycosis fungoides in which the eczematous and lichenous stages were absent. The patient, a woman, aged 58 years, suffered from numerous cutaneous and subcutaneous tumours of a lymphatic type, but had no early glandular enlargement or leukæmia. Three and a half years after the onset of the disease, she died from cachexia.

The interest of the case from an ophthalmological point of view consists in the fact that at one period one of the tumours, which was situated in the right lower eyelid, assumed such importance as to lead the patient to consult an ophthalmic surgeon. R. J. COULTER.

III.—PIGMENTATION OF THE EYE.

(1) **Augstein, Karl.—Pigment studies in the living eye. (Pigmentstudien am lebenden Auge.)** *Klin. Monatsbl. f. Augenheilkunde*, Januar, 1912.

(2) **Gradle, H.—Anomalies of the retinal pigment epithelium, and their clinical significance.** *Annals of Ophthalmology*, January, 1914.

(3) **Rubert, J.—On pigmentation of the cornea in the guinea pig, with general remarks on the conditions of pigmentation in the anterior part of the eye, discussed in connection with the similar conditions of the skin. (Ueber Hornhautpigmentierung beim Meerschweinschen. Nebst Bemerkungen ueber die Pigmentverhältnisse im vordersten Abschnitte des Auges überhaut, erörtert im Zusammenhange mit solchen der Haut.)** *Arch. f. vergleichende Ophth.*, Bd. IV, S. 1, Januar, 1914.

(4) **Maggiore, Luigi.—The present state of knowledge of the histogenetic significance of the retinal pigment. (Lo stato attuale delel conoscenze sul significato istogenetico del pigmento retinico.)** *La Clinica Oculistica*, Gennario, 1914.

(5) **Anselmi.—A histological study of a form of pigmentation of the conjunctiva covering the upper tarsus. (Studio istologico su una particolare pigmentazione della congiuntiva del tarso superiore: contributo allo studio delle alterazioni spontanee delle ghiandole di di Meibomio).** *Archivio di Ottalmologia*, Gennario, 1914.

(1) **Augstein,** of Bromberg, enumerates the situations in which pigment can be observed in the anterior part of the eye during life, and the circumstances under which it occurs.

Pigment particles may be found in the conjunctiva bulbi, with or without similar particles in the cornea, after injury, in connection with relapsing vitreous hæmorrhage, and after cataract extraction. This pigment is hæmatogenous. Two factors are necessary for its appearance, extravasation of blood and the presence of some free uveal pigment cells. The latter, according to the author, construct the deposited pigment out of the hæmoglobin of the extravasated blood. Pigment rings may frequently be noted surrounding the scleral veins at their point of exit in the ciliary region. This form of conjunctival pigmentation is physiological, but not congenital. The earliest appearance is about the age of six months, and it becomes increasingly common in later life. It is most common in old persons and in brunettes. After inflammation in the uveal tract, these pigment rings become more pronounced, and new pigment develops in their neighbourhood. This is to be attributed to the wandering of uveal pigment.

Pigmentation of the cornea may be in or below the epithelium, in the corneal substance, and on or beneath Descemet's membrane. It has been found under the epithelium after healing of a corneal ulcer which had been cauterised, and after a burn of the cornea, in both cases without vessel formation. Pigment deposits on Descemet's membrane were observed in one case after removal of traumatic cataract, no inflammation having occurred. They are often seen after prolonged use of miotics in glaucoma, and are believed to be attributable to the miotic. Another form of corneal pigmentation is that associated with the vessels left in front of Descemet's membrane after an attack of keratitis parenchymatosa, or iridocyclitis. Pigmentation is also sometimes the result of a contusion. Melanosis corneæ is a condition *sui generis*, and is congenital. It has, in the author's opinion, nothing to do with membrana pupillaris perseverans.

Augstein has observed in the majority of cases submitted to iridectomy or extraction of cataract, fine specks of pigment scattered over the anterior surface of the iris, especially in its lower half. They first appear two or three weeks after operation. A similar condition has been observed after a contusion, and following a perforation of the cornea. Deposits of pigment on the iris after iritis are less common.

Augstein's observations were, of course, made with the assistance of the corneal microscope, and many of the conditions described could hardly be seen with the naked-eye. Four coloured plates accompany the article,

A. J. BALLANTYNE

(2) The greater prominence which the pigmentary changes present in markedly neurotic subjects raises the question to **Gradle**, of Chicago, whether instability of the central nervous system may not reveal itself by the liability of the retinal pigment epithelium to undergo structural changes; for these cells are embryologically a part of the brain. R. H. ELLIOT.

(3) In many animals, as is well-known, and in the negroid races of man, a zone of pigmentation is present at the limbus, and Bayer and Yamaguchi have reported cases in which it showed a tendency to invade the cornea. The pigment occurs normally in two situations—in the epithelium, and in the subconjunctival and episcleral tissues, where it takes the form of branch chromatophores. In the animal kingdom there is often a relationship between the degree of development of the two forms, and also a relationship between the distribution of the corresponding types of pigment in the skin; in fishes, amphibia, and many reptiles, for instance, pigment is absent in the conjunctival epithelium and in the epidermis, but abundantly present in the subconjunctival tissues and in the corium; in mammals, on the other hand, epithelial pigmentation is the rule, while pigment in the episcleral tissues and corium is scanty, and may be absent.

As to the ultimate derivation of the pigment, there has been much controversy, resulting in a tendency to reverse former opinions. At first, it was believed to be elaborated primarily in the mesoblastic chromatophores and passed on by them into the epithelium ; subsequent experiments with Röntgen rays and sunlight seemed to show that the pigment was formed in the epithelial cells quite independently of the underlying tissues ; and the latest idea seems to be that the chromatophores of the corium and episcleral tissues are not mesoblastic at all, but displaced derivatives of the epithelium.

In the non-albinotic guinea-pig, pigment is never absent from the limbus. It consists of fine, brown-black granules, which give no iron reaction, and are found in all the layers of the epithelium, but much more densely in the basal cells. Granules derived from the epithelial cells are also found in the intercellular spaces. Episcleral chromatophores may be absent, and, when present, no manifest connection between them and the epithelium can be traced.

The abnormal pigmentation of the cornea, which is the special subject of the paper, by **Rubert**, of Kiew, was present in 8 out of 152 guin a-pigs. It was situated in the superficial layers, and was lighter in tint than the normal pericorneal zone, but always directly connected with it. It took the form of linear streaks, irregular areas, or a broad encroachment of the marginal zone, and always occupied the upper part of the cornea. The microscopical conditions closely resembled those which are normal at the limbus ; the pigment occupied all the layers of the epithelium, but more especially the deepest. The cells themselves were unlike the normal epithelium of the part. They were small and low, resembling rather the basal cells of the conjunctiva, sometimes even round, cubical, or flattened. Moreover, degenerative changes—variation in size, vacuole formation, even breaking up of the cells—were present. The subjacent tissues were also abnormal, being converted into a kind of vascular granulation tissue.

Rubert believes that this corneal pigmentation is derived from the conjunctival by an active wandering inwards of the cells, which find their way in a single layer among the intercellular spaces. Certain elongated pigmented elements seem to represent the cells in process of emigration. Arrived in the cornea, these cells displace the basal cells, and, by proliferating, also replace all the other layers of the epithelium. The new cells, however, perhaps from the abnormal nature of their substratum, are not the healthy cells of the part, but show a liability to regressive metamorphosis. The same kind of replacement of unpigmented by pigmented cells occurs in the guinea-pig when white skin is transplanted into black, or black into white, and in this case also the process is confined to the epithelium. In the present instance the stimulus to emigration was presumably the inflammation which gave rise to the layer of pannus-like granulation tissue. In the human negro eye a similar pigmentation of the cornea after keratitis has been observed by Steiner and Pergens. It has been pointed out by the reviewer (*Proceedings of the Royal Society of Medicine, Section of Ophthalmology*, p. 10, 1913) that in dogs corneal pigmentation occurs with considerable frequency after peripheral injuries and ulcers, and in a form of keratitis described by him. In his cases, however, it was chiefly the episcleral pigment which had undergone proliferation. GEORGE COATS.

(4) What is the histogenetic significance of the retinal pigment ? To reply to this question, says **Maggiore**, of Rome, we must first solve two fundamental riddles, *viz.* : how the pigment originates in the cells of the outer layer of the secondary optic vesicle, and how it regenerates in the adult cells, and we must first come to a clear understanding on the morphological value of the

granules of pigment. This pigment is not a simple element: it consists of a stroma and of a coloured material which gives the characteristic tint. This fact was first demonstrated by Reinke in 1894, who, decolourising pigment cells and again staining them, found coloured bodies in the position of the pigment granules. The stroma is generally said to be derived from the cell nucleus, but some authorities, as Heidenhain, hold different opinions. Recent researches into the retinal pigment have shown the justice of this latter view, and most authorities now admit the close relationship between the pigment granules and certain parts of the cytoplasm. To these granules and rodlets, Meves has recently given the name of "plastosomes." Luna calls attention to relation between these special formations and the pigment of the pigmented epithelium of the retina. He described the plastosomial apparatus of the retinal epithelium in *Bufo vulgaris*, the granules occupying the choroidal regions of the cells in large numbers, the rodlets in lesser numbers, occupying the middle region of the cell and having their long axes parallel to the long axis of the cell. The internal region of the cell, which is in direct contact with the rods and cones, is occupied with pigment. Between these two last zones there is an intermediate zone where are rodlets of two kinds, mitocondri and fuschine rodlets.

Luna imagines a very close relationship between these two endocellular elements: he thinks that the mitocondri formed near the base of the cell, progress towards the retinal pole, transforming themselves from granules into rodlets, and charging themselves with the substance of the retinal pigment. Since this pigment is continuously consumed under the action of light, it is necessary to imagine a continual regeneration of mitocondri in the cytoplasm.

In another work on the development of plastosomes in amphibia, Luna has shown that the pigment of the endoplasm is preceded in its appearance by a rich condrioma, from which it takes its origin. In the adult, he has demonstrated that the condriosomes are produced continually at the expense of the alouronoid bodies. HAROLD GRIMSDALE.

(5) **Anselmi**, of Modena, noted in a young man a curious form of discoloration of the conjunctiva. The patient had never suffered from any ocular disease, and therefore staining by drugs, and especially by nitrate of silver, could be excluded with some certainty. He noted, on everting the lids, on each upper tarsal plate a grey irregular circular patch. To examine the nature of this, he removed a small piece by means of Bowman's trephine. On microscopical investigation, he found that the slate-grey colour was not due to pigment (not a grain of pigment could be found throughout the mass); but to the presence of a cavity underlying the conjunctiva due to a cystic condition of the Meibomian glands. HAROLD GRIMSDALE.

IV.—SARCOMA OF THE CILIARY BODY AND CHOROID.

(1) **Thompson, George H.—Two cases of sarcoma of the choroid.** *Montreal Medical Journal*, November, 1910.

(2) **Fage.—Melanotic sarcoma of the choroid and its prognosis. (Sarcome mélanique de la choroide et considérations sur le pronostic.)** *Recueil d'Ophtalmologie*, février, 1911.

(3) **Alling, A. N., and Knapp, Arnold.—A case of ring sarcoma of the ciliary body.** *Archives of Ophthalmology*, November, 1911.

(4) **Webster, David.**—A case of sarcoma of the choroid in a tuberculous subject. *Archives of Ophthalmology*, November, 1911.

(5) **Aynesworth, Horace, T.**—Report of case of melanotic sarcoma of the ciliary body. *Ophthalmic Record*, October, 1912.

(6) **Reis, W.**—On ring sarcoma of the ciliary body. (Ueber Ringsarkom Ciliarkörpers.) *Zeitschrift für Augenheilkunde*, November, 1912.

(7) **Lediard, H. A.**—Melanotic sarcoma of choroid with metastases in liver and intestine. *Transactions Ophthalmological Society U.K.*, Fasc. iii, 1912.

(8) **Nettleship, E.**—A case of sarcoma of the choroid of unusual chronicity. *Proceedings of the Royal Society of Medicine*, December, 1912.

(9) **Lange, O.**—Sarcoma of the choroid with reference to experimental tumour investigations and modern views on the histogenesis of tumours. (Zur Lehre vom Sarkom der Aderhaut mit Berucksichtigung der experimentellen Geschwülstforschung und der modernen Anschauungen der Histogenese der Tumoren.) *Klin. Monatsbl. f. Augenheilkunde*, Oktober-November, 1913.

(10) **Alt, Adolf.**—An intra-ocular sarcoma in co-existence with an orbital perithelioma. *American Journal of Ophthalmology*, May, 1914.

(2) **Fage**, of Amiens, remarks on the variability of the course and time of recurrence after removal of sarcoma of the choroid. Three or four years of freedom from recurrence are generally regarded as a fairly sure test of cure, and a much shorter period is safe as far as visceral metastases are concerned, but local recurrences have been reported six and even eleven years after enucleation of the affected eye.

Fage records a case of mixed cell sarcoma, slightly pigmented, which had perforated the sclerotic, and which did not recur locally for four years after enucleation of the eye. Early diagnosis and excision are essential to prevent recurrences, and the author draws attention to the diagnostic value of the presence of pigmented deposits on Descemet's membrane and on the iris. Exenteration of the orbital contents is not, in his opinion, necessary to prevent recurrences in all cases.

The prognosis depends on the period of operation, age of the patient—the rate of growth being slower, and tendency to recurrences and metastases being less in the aged—and the histological characters of the growth—round cells and much pigment being less favourable than spindle cells and less pigment.

J. JAMESON EVANS.

(3) **Alling** and **Knapp**, of New York, find in the literature about forty-five cases of flat sarcoma of the uveal tract, but only about a dozen of ring sarcoma, involving the ciliary body and iris. Their own case was that of a woman, sixty years of age, who had gradually lost her sight in the left eye for two years, until it had become totally blind. Some dark spots were noticed on the sclera about a year after the first blurring appeared. She had had but little pain. The examination showed a tension of +2, with no perception of light. Three tumours were present on the sclera. Transillumination showed a dark shadow over the ciliary region, and as far back as the equator. There had been no injury. The eye was removed, and four months afterwards no sign of recurrence or metastases had appeared.

The pathological examination showed a black mass occupying the whole region of the ciliary body, and at one part extending back to the optic nerve. The tumour was unusually free from blood-vessels.

Only eight examples occur in the literature of a complete ring sarcoma. In each, glaucoma was present, except in Bergmeister's, and this was probably due to the closure of Fontana's spaces; in only three was any external growth mentioned, and in these the perforation appears to have taken place by means of the scleral vessels, although it may also, as partly in Alling and Knapp's case, take place by erosion of the sclera. In about half the cases there was associated with the diffuse growth a definite circumscribed intra-ocular tumour, either presenting into the vitreous or into the anterior chamber at the iris angle, and in all of them this was probably the site of the original growth. Practically, all showed spindle cells, and in some cases endothelioid cells are mentioned. Most of the cases were pigmented.

ROSA FORD.

(4) The patient, a lady of 28 years, had first noticed disturbance of vision in her right eye in January, 1910; print with the affected eye looked smaller than usual, and there were three black spots in front of the right eye. Tension normal and fields of vision normal. A large pigmented area was observed in the fundus, in the infero-temporal part. As the patient gave a positive reaction to von Pirquet's test, and there was some dulness at one apex, it was at first thought that the affection of the eye was tuberculous. Treatment with this in view was, however, ineffective. Potassium iodide was also found useless. In January, 1911, the pigmented area had increased considerably, and the lower part of the retina was detached, while her vision had fallen from normal (with correction), to 20/200. A neoplasm was then diagnosed and the eye was enucleated. Examination of the tumour revealed the fact that it was a sharply limited spindle-celled sarcoma. ROSA FORD.

(5) **Aynesworth**, of Texas, records the case of a doctor who suddenly developed right-sided acute temporo-frontal pains with mild iritis and extensive whitish vitreous exudation, with normal intra-ocular tension, but with loss of the upper two-thirds of the visual field. The attack gradually passed off, and the vitreous exudate became absorbed, so that his vision was 20/100. Some eight months later, he had a similar attack of pain and iritis, but with no exudation into the vitreous. At this time a brownish growth with markings of the ciliary processes could be seen in the lower third of the fundus behind the iris, and there was a prolongation of the growth into the corneo-iridic angle. The eye was excised, and a microscopic examination of the growth showed it to be a vascular melanotic mixed-cell sarcoma. J. JAMESON EVANS.

(6) **Reis**, of Bonn, describes a case of sarcoma in an old man, which had infiltrated the whole ciliary body and invaded the root of the iris. He alludes to other cases, especially to some published by Mayerhoff, of Cairo. In one example the whole iris, while preserving its normal form and appearance, was almost entirely replaced by sarcomatous growth.

T. HARRISON BUTLER.

(7) **Lediard**, of Carlisle, found in the liver a melanotic sarcoma, the origin of which was traced to a melanotic sarcoma of the choroid, for which the eye had been excised some three years previously.

After giving the history of the case, and making some general observations on the prognosis of choroidal sarcoma *qua* metastasis, the author takes up the particular point that in a section from the liver tissue, some distance from nodules of growth, pigmented sarcomatous cells were found in the blood capillaries between the liver cells. The presence of pigmented sarcomatous cells in the blood capillaries between the liver cells calls for special comment in view of the statement which was made by G. R. Ward in the *Lancet* for May 4th, 1912, as follows :—"There are no cases, so far as I have been able to discover, in which the cells of a spindle-celled or melanotic sarcoma have been found in the blood stream, and this absence of evidence in the case of easily recognisable cells is very striking, and this supports my belief that the cells of tissues other than those concerned in blood formation do not, as a matter of fact, gain access to the blood stream." Lediard goes on to say in dealing with this point that had Ward not made special mention of spindle-celled melanotic sarcoma he would not have given the quotation from his paper, because it seems clear enough that, as stated by Fuchs, " the metastases in remote organs arise through embolism. The blood current detaches cells from the tumour and carries them into other parts of the body, where they develop into independent tumours." Again, according to Parsons, the fact of these tumours being always very vascular renders metastasis by malignant emboli easy by the blood-vessels not having any proper wall, as they are bounded only by the cells of growth.

The discussion which took place on Lediard's paper was mainly concerned with the prognosis of choroidal sarcoma with regard to metastasis. As an example of variation in malignancy, **Holmes Spicer**, of London, related the case of a man who remained in perfect health after the removal of a melanotic sarcoma thirteen years previously. Neither recurrence nor metastasis had occurred.

ERNEST THOMSON.

(8) In connection with a case of choroidal sarcoma in which twenty-six years elapsed between the first symptom and the enucleation of the eye, **Nettleship**, of London, by careful notes on this particular case, and by analysis of the literature and of other cases in which he himself has noted a choroid "smudge," emphasises the necessity of carefully watching over as long a period as possible any case in which a solitary spot or patch of dusky colour, free from signs of inflammation, past or present, is seen in the choroid. Although some, perhaps a majority, of such patches may be not only congenital, but likely to stay as they are, others, whether starting on a congenital basis or not, will prove to be incipient sarcoma.

ERNEST THOMSON.

(9) **Lange,** of Brunswick, cites a case of sarcoma of the choroid occurring in a shrivelled eye. The growth was in the third stage. Exenteration of the orbit was performed, with almost certainly incomplete removal of the tumour ; yet there was neither local recurrence nor general metastases after an interval of six-and-a-half years. He quotes other cases in which, after apparently incomplete removal, local and general recurrences remained absent for years, and he contrasts these with the more common cases in which rapidly fatal metastases occur after apparently complete removal of comparatively small tumours confined to the choroid.

He raises the question whether we do well to remove the eye in cases of a small, slowly-growing, choroidal tumour, which is perhaps causing little inconvenience or loss of vision, especially when we remember that local recurrences usually grow much more rapidly than the original tumour. He thinks that some light is thrown on the matter by experimental researches on tumour formation. He would relate the case he describes to Ehrlich's experimentally supported statement that implanted tumours, if of the quick-growing, degenerating type, seldom produce metastases, the absorption of tumour tissue leading to active immunity by the formation of antibodies. He further believes that the rapid onset of metastases after the removal of small tumours finds its analogy in the experimentally ascertained fact that metastases occur more frequently after removal of slowly-growing spontaneous tumours in the mouse, because of insufficient "athreptic" immunity, *i.e.*, because of the presence of certain substances which promote the growth of the tumour. Lucas Championière has called choroidal sarcoma a *noli me tangere*, and the author agrees with him where the choroidal sarcoma is very small.

With regard to the histogenesis of these tumours, Lange agrees with those who trace the origin to cell groups which originated in embryonic life and find themselves in abnormal situations. He thinks that this view makes it comparatively easy to understand the strictly local onset of malignant growth after general inflammation or injury of the eye. He questions whether metastases occurring long after removal of a tumour are true metastases. He believes they are independent growths of tumour germs, rendered active by the same cause which excited the primary growth, probably, if we accept Ehrlich's theory, the presence of some material favourable to their renewed growth. A. J. BALLANTYNE.

(10) **Alt**, of St. Louis, reports what must surely be a very exceptional case, in which a tumour occurred inside the eyeball, along with a tumour of different type in the orbit. The orbital tumour was an (unpigmented) perithelioma, that in the eye was a pigmented angiosarcoma. The ocular growth had perforated the sclera, and the intra-ocular tumour cells had grown out for a short distance, mingling with the cells of the orbital tumour, and growing between them, each cell form retaining its own characteristics. The author considers that the orbital growth was the older, and that the intra-ocular one was of more recent date. Only a comparatively small part of the eyeball was taken up by the pigmented tumour, whereas the orbital growth was so large that it must have occupied nearly the whole orbital cavity. Alt did not see the patient before operation. The patient died about six weeks after the eye and orbital tumour had been removed. There was an enlargement of the liver, but no autopsy was made. ERNEST THOMSON.

V.—ECLIPSE BLINDNESS.

(1) **Speleers.—An annular scotoma following the eclipse of the sun. (Scotome annulaire à la suite de l'éclipse de soleil.)** *XVI Congrès Flamand des Sciences Naturelles et Médicales.*

(2) **Stook.—Scotomata following the eclipse of the sun. (Scotomes à la suite de l'éclipse de soleil.)** *Ibidem.*

(3) **Böhm, K.—Retinitis resulting from observation of the solar eclipse of 17th April, 1912. (Blendungsretinitis infolge der Beobachtung der Sonnenfinsternis am 17 April, 1912.)** *Klin. Monatsbl. f. Augenheilkunde*, April, 1912.

(4) **Wibo.—Ocular lesions consecutive to the eclipse of the sun on April 17th, 1912. (Lésions oculaires consécutives à l'éclipse de soleil du 17 avril, 1912.)** *La Presse Médicale Belge*, 19 mai, 1912.

(5) **Werdenberg, G. F.—Retinitis due to dazzling after eclipse observation. (Blendungsretinitis nach Sonnenfinsternisbeobachtung.)** *Zeitschrift für Augenheilkunde*, Oktober, November, und Dezember, 1913.

(1) The examination of the visual field of several patients who had "fixed" the sun during the last eclipse, and who complained of amblyopia, showed that there existed a concentric diminution of the visual field, enlargement of the blind spot, and an annular scotoma. MARCEL DANIS.

(2) In all the patients examined by **Stock** there was a central scotoma; in three cases there had been retinal hæmorrhages, and a macular ecchymosis was met with once. The amblyopia was invariably very pronounced.

Discussion.

Terlinck believed that amblyopia by auto-suggestion was often present. In one case he had met with pigmentary degeneration of the macula.

Pergens, of Maeseck, had observed four cases, in one of which there was retinal hæmorrhage, and in another retinal œdema. MARCEL DANIS.

(3) The seriousness and importance of eclipse blindness may be gauged from the fact that after the solar eclipse of April, 1912, 210 cases were reported in St. Petersburg, 387 in the Rhine provinces, and 259 in Saxony, while individual Continental clinics reckoned their cases by the score.

The paper by **Böhm**, of Heilbronn, is a statistical review of the cases which occurred in Schleswig and Posen, and the material to which he has had access comprises 412 cases. Men appear to have been more frequently affected than women, and the most common age was from twenty to thirty. The condition was notably infrequent in children, but the author thinks that this was not due to absence of exposure. Several explanations have been offered, and the writer refers to a case occurring in the Breslau clinic which almost suggests a relative immunity of the retina of the child. In this case a teacher and his pupils had together observed the eclipse. The teacher suffered from eclipse blindness in both eyes, while none of his scholars was affected. In most of the recorded cases the eclipse had been observed with the naked-eye. Among protective measures, blue glasses seem to have been least efficient. The structural changes were of a varied character. Macular disturbance was the most frequent, and was sometimes so characteristic as to enable a diagnosis to be made on the result of the ophthalmoscopic examination. Other fundus changes also occurred, and, in addition to these, injuries to the anterior parts of the eye, the lens, the cornea, and the conjunctiva. The visual disturbance took the form of reduction of central vision, central scotomata, both positive and negative, ring scotomata, contraction of the field, colour defects, and metamorphopsia and micropsia. The prognosis as regards the anatomical changes was found to be relatively good, and the same was true of the visual defects. In many cases, however, both functional and anatomical changes persisted, and in these it is supposed that the rods and cones had been damaged. It was unusual to find this affection in myopic eyes.

A. J. BALLANTYNE.

(4) **Wibo** has observed twelve individuals with eye troubles after having watched the eclipse of the sun with the naked eye or protected by inadequate glasses. The lesions observed may be summed up as follows: central or peripheral scotoma, retinal hæmorrhages, inflammations or violent congestions of the optic papilla and of the surrounding retina. MARCEL DANIS.

(5) **Werdenberg**, of Basle, contributes a long and exhaustive paper upon the subject of eclipse blindness, a paper which extends through three numbers of the *Zeitschrift*, and leaves little more to be said upon the subject. This paper, read with that published by Birch-Hirschfeld in the *Zeitschrift*, Bd. XXVIII, Heft 4, 5, and 6, forms a complete compendium of the subject.

Werdenberg commences with an explanation of the nature of a solar eclipse, illustrating his remarks with the usual diagrams. He gives a synopsis of the chief astronomical facts connected with eclipses, explaining the periodicity of these phenomena, and the chief varieties, total, annular, and partial. The regular recurrence of eclipses was discovered by the Chinese and the Assyrians, and the period was known as the Saros. A full account of the eclipses recorded in Greek and Latin literature is given, and from these early dates we are led through the middle ages to more recent times. The labours of Tycho Brahe, Kepler, Halley, Newton, and Laplace have built up the modern knowledge of eclipses, which are now predicted with an error which rarely exceeds two seconds. The author recites the references to eclipse blindness made by Xenophon, by Galen, and by other classical authors, and chronologically brings the historical retrospect down to the eclipse of 1912. This eclipse furnished in Germany some hundreds of cases of eclipse blindness, in spite of the warnings issued by the daily press. Those cases which visited the Basle Clinic are described with minute care, and every possible symptom is tabulated and discussed. The whole of the modern literature of the subject is analysed and criticised with reference to each symptom.

Werdenberg finds that in many cases the changes at the macula represented in shape the disc of the sun at the time of observation, they formed in fact an *optogram* or *heliogram*. Birch-Hirschfeld, it will be remembered, came to a different conclusion.

The prognosis depends upon the severity of the dazzling. If, at the end of a month, symptoms still remain, the prognosis is not good. Metamorphopsia is a bad sign. The prospect of recovery cannot be gauged by the presence or absence of ophthalmoscopic changes at the macula.

The chief treatment adopted at Basle was subconjunctival injections of normal saline and the administration of iodides. This treatment seemed to shorten the period of recovery.

An account is given of the experimental work which has been done by Birch-Hirschfeld and others.

Two plates accompany the paper. One shows photographs of the eclipse ; the other, a coloured plate, illustrates the nature of the changes observed at the macula. T. HARRISON BUTLER.

VI.—ANTHRAX.

(1) **Fricker, E.—Anthrax of the lid.** *Wochenschrift f. Therapie u. Hygiene des Auges*, 16 November, 1911.

(2) **Manulescu.—Bilateral atrophy of the optic nerve following an anthrax carbuncle of the right upper lid. (Beiderseitige Atrophie des Sehnerven in Folge von Milzbrand-Karbunkel des rechten Oberlides.)** *Bericht der Ophthalmologischen Gesellschaft*, Heidelberg, 1912.

(3) **Leplat, Rivière, and Bettremieux.—A case of malignant pustule of the eyelids. (Un cas de charbon des paupières.)** *La Clinique Ophtalmologique*, 10 novembre, 1913.

(1) **Fricker**, of Basle, reports a case of anthrax of the lower eyelid, in an agricultural worker, following the bite of an insect. After removal of a crust of about the size of a florin, a dirty bleeding ulcer was seen with hard infiltrated

base. Œdema of the lid and enlargement of the pre-auricular and sub-maxillary glands were present. There was no complaint of pain at any time. The anthrax bacillus was found in scrapings. The ulcer was treated with iodine, and a moist dressing of acetate of aluminium applied. As the ulcer continued to enlarge, and another crust had formed upon its surface by the following day, this was removed, and 3 c.cm. of a 5 per cent. solution of carbolic acid injected into the infiltrated base and neighbouring parts. The same dressing was re-applied, and by the tenth day the anthrax bacillus could no longer be discovered in the discharge. Complete recovery followed, and the patient was quite well three months later. Excision of the ulcer was decided against on the ground of the danger of general infection. The virulence of the organism does not appear to have been tested.

W. B. INGLIS POLLOCK.

(2) **Manulescu**, of Bucharest, described a case of bilateral complete optic atrophy which followed a severe attack of anthrax. The malignant pustule was situated on the upper lid, and was surrounded by enormous œdema of the tissues, which extended down the neck to the chest. There was great exophthalmos, chemosis, and lid œdema. Under the influence of serum, the patient made a good recovery, but as soon as the lids could be opened, she was found to be blind. Ophthalmoscopic examination showed retinal œdema and venous hæmorrhages. Later on, complete optic atrophy developed. The veins remained of normal size, but the arteries were reduced to threads.

The author compares the condition to similar cases following facial erysipelas.

T. HARRISON BUTLER.

(3) The greater part of the article by **Leplat**, of Watrelos, **Rivière**, of Roubaix, and **Bettremieux**, of Roubaix, is taken up with the discussion of the question whether anthrax is to be considered as an accident of employment, the smaller portion only dealing with an individual case of malignant pustule of the eyelids. The conclusions come to by the authors on the first question do not seem to be very definite, since apparently the disease is certainly sometimes an accident of employment, and at others a professional disease "*assimilable à un accident de travail.*" In the case reported, the diagnosis rested on the appearance and course of the disease, since bacteriological examination was negative. The authors of the article hold, in opposition to Morax, that the diagnosis can be made, by those who are in the habit of seeing the malady, without bacteriological evidence.

ERNEST THOMSON.

VII.—MICKULICZ'S DISEASE.

(1) **Evans, J. Jameson.**—A case of Mikulicz's disease. *Birmingham Medical Review*, August 15th, 1911.

(2) **Tacke.**—A contribution to the ætiology of Mikulicz's disease. (Contribution à l'étiologie de la maladie de Mikulicz.) *Ann. d'Oculistique*, février, 1912.

(3) **Aubineau.**—A case of Mickulicz's disease. (Un cas de "maladie de Mickulicz.") *Ann. d'Oculistique*, juin, 1912.

(1) **Jameson Evans,** of Birmingham, gives a full clinical description of a case of this disease, the only one reported in the United Kingdom so far as he knows. The case-details must be sought in the original.

(2) **Tacke,** of Brussels, records a case which, in his opinion, throws fresh light on the ætiology and prognosis of Mickulicz's disease.

The patient complained of swelling of the eyelids, which had come on suddenly about two months previously, accompanied by severe headache and a feeling as if the eyes were retracted, both eyes being affected "almost simultaneously." On examination, she was found to have enlargement of both palpebral lacrymal glands, which formed tumours, at least half a centimetre in diameter, pushing the outer ends of the eyelids upwards and away from the eyes. There was slight bilateral exophthalmos and enlargement of the orbital lacrymal glands and the parotids, but no involvement of the glands of the axilla or groin. The urine was free from albumin and sugar, and there was no sign of syphilis, but four months before the onset of the ocular symptoms, the patient had had an attack of blennorrhagia, followed by gonococcal endometritis, which lasted three months. Permission to remove a piece of the swollen gland for microscopic examination was refused. Under treatment with potassium iodide internally, and hot compresses locally, the exophthalmos and distortion of the eyelids disappeared in eight weeks, and a complete cure was ultimately obtained.

A critical examination of the thirty cases of Mickulicz's disease which he has found recorded leads Tacke to the conclusion that they are all either of neoplastic origin or due to disease of the blood. He fails to find any grounds for including his own case in either of these classes, and considers that it was due to gonorrhœal infection from the inflamed endometrium through the blood. Although he can find no recorded case of metastatic gonorrhœal inflammation of the lacrymal gland, he is of opinion that such a condition is one which is likely to occur, in view of the existence of similar infections of the conjunctiva, iris, testicle, and epididymis. Finally, he holds that cases of lymphadenitis and leucæmia in which the involvement of the lacrymal gland is only part of the inflammation of all the lymphatic glands, should be distinguished from those cases in which there is a simultaneous inflammation of the lacrymal and parotid glands alone due to known or unknown endo- or exogenous germs, and that only the latter should be regarded as constituting a typical disease. R. J. COULTER.

(3) **Aubineau,** of Brest, records a typical case of Mickulicz's disease in a girl, aged 13 years. The parotid glands were treated with X-rays (hard tubes giving 7 to 8 Benoist, filtered with 5/10 aluminium) on June 3rd, 16th, July 27th, and August 31st. The lacrymal glands were treated with applications of radium "*à sel colle*" of 500,000 activity, lasting 1½ hours, on June 3rd and 16th and August 31st. There was definite improvement on July 7th, which had become so marked by September 24th that treatment was stopped, and on December 22nd, the patient was regarded as cured.

R. J. COULTER.

VIII.—SIGHT IN THE ONE-EYED.

(1) **Dor, Louis.—Is it possible to lower from 33 per cent. to 25 per cent. the reduction of working capacity in the one-eyed? (Peut-on abaisser de 33 pour cent à 25 pour cent la réduction de capacité de travail des borgnes?)** *La Clinique Ophtalmologique*, 10 octobre, 1912.

(2) **Zeeman, W. P. C.—Vision in the one-eyed. (Das Sehen des Einäugigen.)** *Klin. Monatsbl. f. Augenheilkunde*, Dezember, 1912.

(1) The article by **L. Dor**, of Lyons, is concerned with the differences in the compensation laws in Germany and France.

(2) **Zeeman**, of Amsterdam, attempts to throw light on the questions whether, during the first year or so after the loss of an eye there is any increase of the monocular power of depth-perception, and whether measurement of this power gives a guide to the assessment of compensation for injury. He points out that monocular and binocular vision differ both quantitatively and qualitatively. We have to take into account differences in light and dark adaptation, differences in central vision, differences in the power of fixation, and differences in the field of vision, as well as the more important differences in power of depth-perception.

In dark adaptation a surface looks brighter to two eyes than to one; that is to say, the threshhold is lower for binocular than for monocular vision. It is a familiar fact that central visual acuity is often better when both eyes are employed than with one eye alone. The reason for this has not yet been clearly established, Two explanations are suggested.—The first is that if there is an uncorrected or incompletely corrected astigmatism, letters which are imperfect to one eye may be clear to the other, the two eyes thus supplementing each other and together producing a better result than could be obtained with either one alone. The other explanation depends on the assumption, which still needs proof, that fixation of an object is steadier and less difficult with two eyes than with one.

Coming to the differences in the depth-perception of the one-eyed and the two-eyed, the author first considers all the different factors which enter into the composition of this faculty, and reaches the conclusion that the one-eyed is at a disadvantage as compared with the two-eyed in the loss of the binocular parallax and of the information derived from convergence, and that he has to depend on the monocular parallax (involving movement of the head or of the object) and on information derived from shadows and other phenomena of less importance. It has been proved experimentally that the time required for the appreciation of the relative positions of two objects is much less in binocular than in monocular vision. The figures arrived at by Zeeman are 1/200 and 1/2 second respectively. Of course, all tests bearing on this point involve the fallacy that the intellectual capacity of the individual influences the results, but, as the author points out, the same influence comes into play in the restoration of a man's capacity for his work. Some of the author's conclusions are as follows.—Uniformity in the character of the work favours an early re-aquisition of working capacity, and change of occupation is unfavourable in this respect. No method of measuring depth-perception can give conclusive proof of the working capacity of a one-eyed person. Probably with even the most complete adaptation to the new conditions, the one-eyed is slower at appreciating depth differences, and is more readily fatigued. At the same time the author thinks that the increased effort demanded in these circumstances is not more than is possible to the average healthy man.

A. J. BALLANTYNE.

IX—EMBOLISM OF THE CENTRAL ARTERY OF THE RETINA.

(1) **Gruening, E.—Embolism of the right central retinal artery in a boy aged eight years.** *Trans. Amer. Ophth. Society*, Vol. XII, Part iii, 1911, p. 978.

(2) **Snell, Albert C.—Two cases of embolism with retention of central vision.** *Ophthalmic Record*, October, 1911.

(3) **Rubert, J.—Embolism of the central artery of the retina. (Ueber die Embolie der Arteria centralis retinæ.)** *Klin. Monatsbl. f. Augenheilkunde*, Dezember, 1911.

(4) **Grilli.—A case of embolism of a branch of the arteria centralis retinae. (Un caso di embolia di un ramo dell' arteria centrali retinae.)** *Rivista Italiana di Ottalmologia*, Febbraio, 1912.

(5) **Teillais.—Three cases of embolism of the central retinal artery occurring during pregnancy. (Trois cas d'embolie de l'artère centrale de le rétine au cours de la grossesse.)** *Ann. d'Oculistique*, septembre, 1912.

(6) **Gjessing, Harald G. A.—A case of unilateral amaurosis presenting the picture of embolism of the central retinal artery, following on a criminal abortion, with remarkably good recovery of visual acuity and field of vision. (Ein Fall von einseitiger Amaurose unter dem Bilde einer Embolia arteriæ centralis retinæ im Anschluss an einen kriminellen Abort mit auffällig guter Wiederkehr des Sehvermögens und Gesichtsfeldes.)** *Klin. Monatsbl. f. Augenheilkunde*, November, 1912.

(1) This case of embolism of the central artery of the retina, occurred in a boy, eight years of age. When seen shortly after the accident by **Gruening**, of New York, the œdematous retina contained many small hæmorrhages, while the "cherry-red spot" was partially concealed by a hæmorrhage, located in the internal layers of the retina. The ecchymoses persisted five months later, and the "cherry-red spot" was then occupied by a reddish-brown figure of an irregularly stellate contour. A systolic murmur was present over the pulmonary area.

In the discussion that followed the reading of Gruening's communication, cases of central retinal embolism in children were mentioned by **Duane**, of New York, and **W. K. Rogers**, of Columbus. SYDNEY STEPHENSON.

(2) The first case by **Snell**, of Rochester, N.Y., was that of a man, aged 56 years, who had a lesion of the mitral valve and developed anopsia of lower-inner quadrant of the right field, without involvement of the point of fixation, as the result of an embolism of the temporal branch of the superior temporal artery, which could be seen to be blocked. No hæmorrhages, enlargement of veins, œdema, or "cherry red spot." R.V. = 20/20 with correcting lenses. This vision was retained owing to the presence of a central cilioretinal artery.

The second case was that of a woman, aged 25 years, whose right fundus presented the typical appearance of embolism of the central retinal artery, except for a normally coloured pear-shaped area extending from the temporal edge of the disc outward beyond the macula, and this area being nourished by a cilioretinal artery. There was no "cherry" spot. The field showed a functionally active oval central area, corresponding to the area of normal retina. R.V. = 20/30. J. JAMESON EVANS.

(3) According to **Rubert,** of Kieff, no case hitherto published has given unequivocal histological evidence of the occurrence of embolism of the central artery. In all the cases there has been evidence of local disease, either endarteritis or thrombosis, to account for the obstruction. Nor has there been any histological description of the changes which cause the appearance of pallor of the fundus and the "cherry-red spot."

Rubert claims that these defects in our pathological knowledge are made good by his case.

The patient died five days after sudden loss of vision in one eye, accompanied by the typical picture of embolism of the central artery of the retina. The eye was obtained shortly after death, and fixed for investigation. A homogeneous and hyaline plug was found to occupy the central artery just in front of the lamina cribrosa. There was very slight endothelial proliferation in its neighbourhood, but otherwise the vessel was normal, and its lumen was not narrowed. A thrombus locally formed could not have undergone such structural changes in the few days between the occurrence of the obstruction and the removal of the eye, and this fact, together with the absence of premonitory visual disturbance, and the healthy condition of the artery, puts thrombosis out-of-court. The case therefore establishes the possibility of embolism of the central artery. The pallor of the fundus was found to be due to œdema of the nerve fibres and inner layers of the retina, and the "cherry spot" to the shining through of the choroid at a point where no œdematous layers intervene. A. J. BALLANTYNE.

(4) The case was seen accidentally at Parisotti's clinic. The patient complained of conjunctivitis; and happened to mention that for a long time she had not seen equally well with the right eye.

It was at once noticed that the lower part of the right disc was very pale, and that the lower branches of the retinal artery were small. The visual field for white was missing from the whole of the superior nasal quadrant.

The patient stated that some fifteen years before, when eleven years old, she noted one day that with the right eye she could not see the whole of any object. No attention was paid to this. About six months after, she was attacked by *morbus cordis*, which confined her to bed, very ill, for some time. From this illness, **Grilli** thinks one can consider the condition most probably to have been embolism.

He explains that the difference between the completely atrophic appearance of the lower half of the disc and the quadrant loss of the visual field, by supposing the embolism to have extended after its first block.

HAROLD GRIMSDALE.

(5) **Teillais**, of Nantes, records three typical cases of embolism of the central artery of the retina occurring about the seventh month of pregnancy in otherwise healthy women. He has been unable to find any other similar cases recorded, but gives an account of a case of blocking of the main superior branch of the retinal artery occurring during the fourth month of pregnancy communicated to him by van Duyse, of Ghent. He considers that the alterations in the constitution of the blood which occur during the course of pregnancy are such as to exercise a preponderating influence on the embolic process, and points out that in his cases the embolism occurred at the period when these modifications attain their greatest intensity.

R. J. COULTER.

(6) The patient whose case is reported by **Gjessing**, of Drammen (Norway), suffered from blindness of one eye, setting in one week after abortion had been induced by the use of a bougie. At first, the vision of the defective eye was *nil*, and the fundus showed the appearances characteristic of embolism of the

central retinal artery. After six weeks of treatment, including massage of the globe, the vision rose to 5/36 Snellen, with recovery of the field of vision to almost normal limits for white and blue. There was still slight reduction of the red and green fields, as well as a relative scotoma for white and colours, and enlargement of the blind spot. Pallor of the disc persisted.

There is now a considerable body of evidence to show that the ophthalmoscopic picture of embolism of the central artery of the retina may also result from thrombosis, from endarteritis, or, without evidence of either of these lesions, as a sequence of severe loss of blood. We are not justified in making a diagnosis of embolism unless there is evidence of the actual blocking of the vessel; a source of an embolus can be found; the existence of disease of the vessel wall can be excluded; and we can find no evidence of thrombosis or its causes. As a rule, the reduction of vision resulting from loss of blood is not profound, and the appearance of the O.D. is often negative, or there may be more or less neuritis, œdema of the retina, etc. In this case the author's first diagnosis was embolism of the central artery, on account of the one-sidedness of the disturbance, the appearance of the fundus, the history, and the absence of cause for, or evidence of, vascular disease. He admits, however, that if Elschnig's postulate is correct, namely, that after embolism there is never restoration of vision later than twenty-four hours from its occurrence, the diagnosis is set aside in this case, and we must look upon it as one of those classed as "amaurosis following loss of blood, with the picture of embolism of the central artery of the retina."

A. J. BALLANTYNE.

X.—REFRACTION AND GLASSES.

(1) **Hegner, C. A.**—A new lens system for the correction of unilateral aphakia. (Ueber ein neues Brillensystem zur Korrektion einseitiger Aphakie.) *Klin. Monatsbl. f. Augenheilkunae*, März, 1912.

(2) **Sulzer, D.-E.**—Simple and accurate methods and equipment for rapidly determining the glasses to correct astigmatism. (Procédés et outillage simples et exacts pour déterminer rapidement les verres correcteurs de l'astigmie.) *Ann. d'Oculistique*, juin, 1912.

(3) **Golesceano, C. B.**—Clinical differences in the choice of spectacles. (Les variétés cliniques dans le choix des lunettes.) *L'Ophtalmologie Provinciale*, août, 1912.

(4) **Stock, W.**—On a new use for Fick's contact spectacles. (Ueber eine neue Verwendungsart der von Fick angegebenen Kontaktbrillen.) *Bericht der Ophthalmologischen Gesellschaft*, Heidelberg, 1912.

(5) **v. Rohr, M.**—On astigmatic lenses with punctate depiction. (Ueber astigmatischer Gläse mit punctueller Abbildung.) *Bericht der Ophthalmologischen Gesellschaft*, Heidelberg, 1912.

(6) **Wolff, H.**—The correction of the anisometropia caused by aphakia by means of a Zeiss doublet. (Korrection der Anisometropie bei Aphakie mittelst eines Zeiss'schen Zweigliedrigen Linsensystems.) *Zeitschrift für Augenheilkunde*, August-September, 1912.

(7) **McMullen, W. H.—Anisometropia.** *Ophthalmic Review*, December, 1912.

(8) **Landolt, H.—The treatment of divergence by overcorrecting concave glasses. (Behandlung der Divergenz durch überkorrigierende Konkavgläser.)** *Klin. Monatsbl. f. Augenheilkunde*, Januar, 1913.

(1) It is a familiar fact that in cases of pronounced anisometropia it is difficult or impossible for the patient to wear the full correction in both eyes, owing to the confusion produced by the difference in size of the retinal images. Generally speaking, a difference of two dioptres is easily tolerated, and in some cases even seven dioptres may be; but in aphakia, in which the refraction difference is higher, the images differ considerably in size, and binocular vision is impossible.

Hegner, of Jena, has enlisted the help of the firm of Zeiss in order to produce a glass which will correct the aphakia, and at the same time give a retinal image of the same size as that in the other eye. Telescopic lenses, such as have been used with some success in the correction of high myopia, are employed. In the first two cases experimentally fitted, satisfaction was not obtained, probably because the patients were not sufficiently interested to persevere with the experiments; but in two other cases the results are said to have been very good. There is, of course, some limitation of the field of vision, but these patients were able to pass even pretty severe tests for depth-perception. The author sees in these glasses a useful appliance for the correction of aphakia in mechanics and others, to whom stereoscopic vision is sometimes of great importance. A. J. BALLANTYNE.

(2) **D.-E. Sulzer**, of Paris, considers that refraction work would be simplified if an identical notation were adopted for both eyes instead of the symmetrical one chosen at the meeting of the Naples International Ophthalmological Society, and if the same figure could be used to denote the reading of the ophthalmometer, the orientation of the cylinder, and the line seen most clearly on the "sunrise" tests by a slightly myopic eye. To accomplish this he proposes.—1. That the vertical meridian be denominated 0°, and the graduation proceed to 180° in the direction of movements of the hands of a clock facing the patient (*i.e.*, the figures on the trial frame would go in the opposite direction to that in which the hands of a clock move). 2. That cylinders should be orientated, not as at present according to their axes, but according to their direction of smallest convergence, *i.e.*, convex cylinders as at present by their axes, but concave cylinders by the direction perpendicular to their axes. 3. That cylinder lenses should be cut in oblong form, with their longer sides parallel to their direction of orientation, and placed in a special trial frame nearer to the eyes than the spheres.

It does not seem as if the advantages to be gained from adopting these somewhat topsy-turvey proposals would be sufficient to counterbalance the obvious confusion which would result from doing so. R. J. COULTER.

(3) In a long article under the above title, **Golesceano**, of Paris, finds that, in 93 cases out of 450 cases, there were individual differences in the selection of the glass that produced normal vision.

The defect in vision does not always correspond to the skiascopic findings. A recent fall in visual acuity does not necessarily mean the onset of fundus disease. The skiascopic shadow may vary from day to day, and may show a marked difference after several days' interval. He is of the opinion, also, that fear will alter the refraction temporarily; he would not on that account, however, have recourse to atropin.

Some of his final conclusions include the following :

A proportion of 1·5 ametropes show individual differences.

All ametropes present points in common. A relatively rapid loss of visual acuity is not associated with ophthalmoscopic findings of any importance.

P. A. HARRY.

(4) **Stock**, of Jena, has used Fick's contact glasses to produce an artificial anisometropia, and then he was able to prove practically the great superiority of Gullstrand's new cataract glasses, and of the new cylinders with punctate depiction over the ordinary types. T. HARRISON BUTLER.

(5) **v. Rohr**, of Jena, describes the new astigmatic lenses which have been introduced by Messrs. Zeiss, of Jena, to abolish the deformity caused by looking through ordinary cylinders. A plate of photographs of a small statue shows graphically the superiority of the new type. The optical principles are fully discussed in the paper. The new cylinders are superior to toric lenses.

T. HARRISON BUTLER.

(6) **Wolff**, of Berlin, reports an interesting case, in which a young man acquired a traumatic cataract which was eventually needled, and an acuity of 5/6 obtained with a + 12 D. correcting glass. This was ordered as a monocle, but was not worn. A divergent squint appeared, which was cured by operation. A Zeiss doublet was now ordered, and with it the patient obtained stereoscopic vision. He is now wearing the correction in comfort as a monocle. T. HARRISON BUTLER.

(7) **McMullen**, of London, calls attention to possible causes for discomfort by the use of unequal glasses, such as the production of an artificial heterophoria due to the prismatic effect of the glasses, when the visual axes do not pass through the optical centres when reading, the difference in size of the retinal images if the optical centres of the lenses and the anterior focal points of the eyes do not coincide, differences in form and definition of images from oblique passage of the visual axes through the glasses and possibly some inequality of focus in the refracting systems made up of each eye and the correcting lens. To reduce these causes to a minimum, very accurate centering of the glasses should be secured, and even a second pair specially centered and adjusted for near work ; periscopic lenses lessen the prismatic effects when the visual axes pass obliquely, but may increase the difference in the size of the images. Where these efforts to adjust fail, the less affected eye must be corrected, and a lens of about the same strength be placed before the other.

Several cases are given, showing mode of treatment and results obtained.

A. H. PAYAN DAWNAY.

(8) **Landolt**, of Strassburg, utilising the principle on which convex glasses are prescribed in the treatment of convergent squint, namely, that by reducing the demand for accommodation, they minimise the impulse to convergence, employs concave glasses in the treatment of divergent squint. His remarks apply to divergent squint in young people. The glasses are of such a strength as to overcorrect the myopia (they may even be given when the error is not myopic), and the author claims that the excessive effort of accommodation stimulates convergence, and that after some practice, single binocular vision is established.

He records two cases which illustrate his point. A. J. BALLANTYNE.

XI.—INTERSTITIAL KERATITIS.

(1) **Igersheimer.—Upon the future fate of patients with interstitial keratitis due to congenital syphilis. (Ueber die weiterern Schicksale von Patienten mit Keratitis parenchymatosa auf hereditär-luetischer Grundlage.)** 39 *Bericht der Ophthalmologischen Gesellschaft*, Heidelberg, 1913.

(2) **Fage.—Relapses of parenchymatous keratitis. (Les récidives de la kératite parenchymateuse.)** *La Clinique Ophtalmologique*, 10 juillet, 1913.

(3) **Fernandez, Santos.—Interstitial keratitis in my ophthalmic practice. (La queratitis intersticial en mi pratica oftalmologica.)** *Arch. de Oftal. Hispano-Americanos*, Enero, 1913.

(1) **Igersheimer**, of Halle, has investigated the final condition of 152 eyes affected with interstitial keratitis. Only 59·2 per cent. had an acuity of from 5/4 to 5/15. The remainder, 40·8 per cent., had an acuity of from 5/35 to total blindness ; that is to say, they were only fit for rough work, which could be carried on with the poor vision they possessed. In one-third of all the cases the patients were myopic, and had probably become so as a result of the disease. Those who had passed through the disease in childhood had made better recoveries than those who had been attacked later in life. Rise in tension and lowered tension were both noted during the disease, but as the cornea cleared up, the tension became normal. In addition, 40 per cent. of the cases gave evidence of pathological changes in the nervous system. In one case the syphilis was transmitted to the third generation. The author advises that all cases should be energetically treated with salvarsan and mercury to avoid these complications, although, as he states, an antisyphilitic course has no influence upon the keratitis itself. The effect of such treatment may be so successful that the patient may contract syphilis a second time.

Axenfeld, of Freiburg, had noted a thickening of the anterior capsule in these cases, and this was in cases where there had been no posterior synechiæ. He thought that subjects of interstitial keratitis died young, and were liable to especial dangers in the senile period. Wicherkiewiez, of Cracow, Hirschberg, of Berlin, Elschig, of Prague, Lauber, of Vienna, and Gutmann, of Berlin, also took part in the discussion. T. HARRISON BUTLER.

(2) The French draw a distinction between the words *récidive* and *rechute*. The former means a re-appearance after months or years ; the latter, a relapse in the more ordinary English sense. Even the word recrudescence hardly translates the French word *récidive*. In any case, **Fage**, of Amiens, means that after being apparently cured, parenchymatous keratitis may reappear after an interval of months or years. Various percentages have been given by authors. von Hippel gave it as 17, Desvaux as 12, and Colomb as 8 per cent. Fage says that of 70 cases, 17 per cent. relapsed at intervals of from six months to eight years. All the cases which thus relapsed were considered to be due to hereditary syphilis. Basing on these facts, Fage pleads for a long and strong specific treatment in hereditary specific interstitial keratitis.

ERNEST THOMSON.

(3) **Fernandez** has seen numerous cases of interstitial keratitis, not only in whites, but also in negroes and mulattos, and has not noticed that there is any difference of the course of the disease in the different races. He has observed a greater frequency in women than in men, and this observation has

been borne out by others. He is convinced of the value of mercurials in the treatment of this affection, and points out that it is often necessary to continue the treatment even after the cornea appears wholly normal, in order that relapses may be prevented,

He calls attention to the value of the ocular signs in establishing a diagnosis of the nature of certain forms of joint-disease, and *vice versâ*.

HAROLD GRIMSDALE.

XII.—RETINAL ASTHENOPIA.

Aubineau, E.—Retinal asthenopia. (L'asthenopie rétinienne.) *Archives d'Ophtalmologie*, mai, 1914.

With the progress of time "retinal" or "nervous asthenopia" has steadily established itself as a clinical entity, distinct from accommodative or muscular asthenopia.

Aubineau, of Nantes, who has reviewed and tabulated his cases, finds that it is frequently met with in practice, and regards it as an ocular manifestation of "asthenia," employing the term in the sense that it is now used in psychiatry.

The symptomology is purely subjective, and the trouble consists in the inability of the patient to use the eyes for a sustained effort, more or less long according to the individual, and more marked for near vision, which of necessity involves a greater effort. An attempt to continue reading is often followed by an ocular or orbital discomfort rather than an actual pain, a sensation of smarting in the lids with a desire to close them leading to somnolence. The retinal asthenope is usually much reassured with a prescription for convex glasses, but his satisfaction is of short duration, for they fail to cause the ocular fatigue to disappear. The condition is not confined to emmetropes, for in a patient with retinal asthenopic symptoms there may be superadded those due to a refractive error or muscular unbalance. These are quite distinct, however, and disappear on correction with suitable glasses, whilst those due to retinal asthenopia persist.

Aubineau has tabulated 74 cases of retinal asthenopia. The age of the patients varied from 11 to 65 years. Thirty-one were males and 43 females, the predominance of the latter being explained by their greater exposure to fatigue by reason of their sex. Forty-two cases were emmetropes and 26 were ametropic, chiefly hypermetropic, but including 2 cases of astigmatism and 4 myopes. In nearly all the cases the muscular balance was normal; 2 only showed slight insufficiency of convergence.

In one-fourth of the cases there was in the antecedents evidence of congenital or acquired taints, neuropathic or psychopathic phenomena, and the author is inclined to the view that heredity plays an even greater part in the ætiology than this proportion would indicate. In more than sixty per cent. of the cases there was a clear history of either moral disturbance, mental or physical overwork or a change in the organism following an operation, an infection or pregnancies. In four post-operative cases chronic alcoholism was present. The dominant symptom which accompanies retinal asthenopia is a general depression and is rarely found wanting.

In addition, there may be loss of memory, impairment of will-power, emotion and anxiety. Two of the author's cases required detention, one of which presented periods of asthenia interrupted by crises of excitement. Headache, insomnia, spinal pain and gastro-intestinal troubles may accompany the depression. The whole is a picture of the neurasthenic state and so commonly found associated with retinal asthenopia that the presence of the latter alone is sufficient to warrant a diagnosis of the former. The prognosis depends directly upon the degree of the neurasthenia, and the most favourable amongst the author's cases were those following overwork.

The term "retinal asthenopia," created by Meyer, is, in Aubineau's opinion, a reasonable one, as being indicative of an origin independent of the ocular musculature, but he prefers the American designation, namely, "asthenic neurasthenia," as a more logical term, notwithstanding the pleonasm in the etymology of the two words.

In conclusion, Aubineau sums up as follows:—

1. "Retinal asthenopia" is a condition in itself, a special ocular fatigue characterised by troubles of the visual application which renders a sustained effort of vision an impossibility. It is independent of and distinct from the accommodative asthenopia of Donders and the muscular asthenopia of von Graefe.

2. "Retinal asthenopia" is always associated with a neurasthenic condition.

BERNARD CRIDLAND.

XIII.—OPERATIONS.

23.—Sclerotomy.

(1) **Wicherkiewicz, M.—Further experiences with my sclerotomia cruciata multiplex (grill-like sclerotomy).** *Ophthalmology*, July, 1913.

(2) **Elliot, R. H.—The technique of the operation of sclero-corneal trephining for glaucoma.** *Lancet*, March 21st, 1914.

(3) **Puscariu, Elena.—Elliot's sclero-corneal trephining in secondary glaucoma. (La trépanation scléro-cornéenne d'Elliot dans le glaucoma secondaire.)** *La Clinique Ophtalmologique*, 10 août, 1914.

(4) **Reinhold, C. H., Captain I.M.S. — Sclero-corneal trephining for staphyloma of the cornea—seventeen cases.** *Indian Medical Gazette*, May, 1914 (XLIX, 181).

(1) The operation of grill-like sclerotomy was devised by **Wicherkiewicz**, of Cracaw, for cases of glaucoma simplex and others where iridectomy or anterior sclerotomy fail to give lasting results. It is based on the view that in these cases the sclera is more rigid than normal, and that the increase of connective tissue blocks the lymphatic channels which surround the vessels penetrating the sclera, and thus contributes to increase of intra-ocular pressure. The author believes that multiple reticular incisions in the sclera should make it more expansible, lower the pressure exerted by it, and so prevent stasis of lymph in the suprachoroidal space. He also thinks that his operation is

peculiarly applicable to those cases in which there is cupping of the disc and hardness of the eyeball to the finger, but without tonometric increase of pressure.

In performing the operation, anæsthesia is induced by subconjunctival injection of one per cent. cocaine solution in the upper temporal region of the globe. The eye is then rotated far down by an assistant by means of a sharp hook inserted above the cornea. The surgeon makes a long meridional incision through the conjunctiva in the upper temporal region. This is carried down to the sclera, and he then makes from four to six meridional incisions in the sclera, ten or twelve millimetres long, and an equal number of cross sections. Some of these incisions are deepened to the extent of two or three millimetres, as far as the choroid. The superficial wound is closed by means of sutures, the eye massaged, and a bandage applied for a day or two. The sutures are removed in four days. A. J. BALLANTYNE.

(2) This is a short article in which **Elliot**, of London, condenses his experiences of the trephine operation as now carried out in India, in England, and in America.

Elliot's work is now so well known that we shall be content to pick out only one or two points.—Regarding the quadrant of the eye to be selected, he says that although it is not always possible to choose it, the upper quadrant is preferable because (1) the wound is less exposed there to infection, (2) the iridectomy is under cover of the lid, (3) the conjunctival flap rarely requires a stitch in this situation, (4) the measurement from the angle of the anterior chamber to the limbus is greatest above. The flap incision of the conjunctiva starts high up on the globe, runs concentric with the limbus, and ends on either side opposite the highest point of the cornea and about eight millimetres from it. The caution given to avoid cutting the eyebrows seems unnecessary, since the eyebrows are usually shaved. Full directions are given for the dissection of the flap, more especially with reference to the deep dissection only of the central part of it. Elliot uses the closed blades of sharp-pointed scissors for the "splitting" of the cornea. He prefers, as a rule, a 2 mm. trephine of the special weight of half-an-ounce: this works with its own weight, requiring no pressure. Iridectomy is done as a routine. If the prolapse of iris is free and large, we must avoid seizing the whole of it in the forceps, but take only the peripheral portion and form a marginal button-hole coloboma.

With regard to the important point as to stitching the flap of conjunctiva, Elliot says that when the operation is in the superior region the flap has not, as a rule, much tendency to detach itself. If it seems to be lying easily in good position, no stitch need be applied, but if it shows a tendency to be displaced by slight movements of the globe it is better to insert a suture at once rather than to risk the inconvenience of having to do so the next day. For replacing the iris after the iridectomy, Elliot prefers to irrigate with sterile saline solution unless the iris has been dragged into the wound and impacted there. In completing the operation, the upper lid is lifted off the globe, while the patient is told to close the eyes and to look upward.

No drops are employed immediately after the operation unless the pupil shows a tendency towards upward displacement, in which case eserine drops, four grains to the ounce, are instilled. On the third day, provided that the tension is down, a solution of atropine, four grains to the ounce, is used, "unless the pupil is already widely dilated and active."

ERNEST THOMSON.

(3) **Puscariu,** of Bucharest, writes enthusiastically on the value of trephining in secondary glaucoma due to adherent leucoma, traumatic cataract, and chronic iritis with seclusion of the pupil. ERNEST THOMSON.

(4) Two of the seventeen cases reported by **Reinhold,** of Bijnor, were of conical cornea. Trephining is reported to have reduced the curvature of one of these corneas to normal, although it did not influence the other case. In eleven of the remaining fifteen (staphylomatous) eyes, free filtration was established by the operation. All but two of the patients were under observation for some months, three to nine months. There were ten successes and three failures. In the successful cases the curvature of the eye was restored nearly or quite to normal. In five cases vision was much improved, but no details are given in this respect. In the majority of cases a cosmetic result only was possible, the staphyloma being complete. In India most patients prefer to keep an unsightly eye, rather than have it enucleated. In Europe or America there is not the same field for this treatment.

The three failures were due to blockage of the trephine hole by the lens. In one of these cases, the lens capsule had been ruptured by the trephine.

H. HERBERT.

24.—Cataract.

(1) **Kuhnt, H.—A contribution to the treatment of infection following cataract extraction. (Ein Beitrag zur Behandlung der Infektionen nach der Starausziehung.)** *Zeitschrift für Augenheilkunde*, Oktober 1913.

(2) **Jackson, Edward.—Discission of the crystalline lens.** *Archives of Ophthalmology*, November, 1913.

(3) **Ewing, A. E.—A new method of delivering the lens in its capsule.** *American Journal of Ophthalmology*, November, 1913.

(4) **Harbridge, D. Forest.—Senile cataract extraction followed by certain complications.** *Annals of Ophthalmology*, January, 1914.

(5) **Darier, A.—Protection of corneal wounds by covering with conjunctiva. (Cataract operation, trephining, traumatisms.) [Protection des plaies cornéennes par recouvrement conjonctival (Opération de cataracte, trépanation, traumatismes).]** *La Clinique Ophtalmologique*, 10 janvier, 1914.

(6) **Friedenberg, Percy.—The conjunctival flap in cataract extraction; a new procedure.** *American Journal of Ophthalmology*, February, 1914.

(7) **Jocqs, R.—On surgical intervention in traumatic cataracts. (De l'intervention dans les cataractes traumatiques.)** *La Clinique Ophtalmologique*, 10 février, 1914.

(8) **Truc, H.—The extraction of cataract with the small free conjunctival flap. (L'extraction de la cataracte à petit lambeau conjonctival liberé.)** *Revue Générale d'Ophtalmologie*, 25 février, 1914.

(9) **Bonnaud, F.—Iridectomy in the cataract operation. (L'iridectomie dans l'operation de la cataracte.)** *La Clinique Ophtalmologique*, 10 mars, 1914.

(10) **Holland, H. T.**—**Observations on a thousand cataract operations performed in six weeks at Shikarpur, North Sindh.** *Indian Medical Gazette*, June, 1914, Vol. XLIX, p. 213.

(11) **Baird, R., Major, I.M.S.**—**Two years' experience of extraction of cataract in the capsule, with notes on 1,137 consecutive operations.** *Indian Medical Gazette*, June, 1914, Vol. XLIX, p. 215.

(12) **Newman, E. A. R., Lieut-Col., I.M.S.**—**Irrigation after extra-capsular extraction of cataract.** *Indian Medical Gazette*, June, 1914, Vol. XLIX, p. 218.

(1) **Kuhnt,** of Bonn, remarks that although infection after extraction is now very rare, yet, in spite of the greatest care, cases will occur to all operators from time to time.

He has often succeeded in saving the eye by removing the infiltrated corneal lip of the wound, extracting the pupillary exudate and the capsule sac with forceps, and irrigating either with normal saline or with a solution of oxycyanide of mercury, 1 : 10,000. Recently, however, he has adopted a simpler method.—He opens the wound along its entire length, removes the exudate and the capsule sac with forceps, and irrigates as before. The wound is opened at least once a day, and allows the aqueous to escape, until the inflammation shows signs of abating. An iridotomy with de Wecker's scissors may be necessary at a later date. T. HARRISON BUTLER.

(2) **Jackson,** of Denver, Col., describes a method of dealing with cataract suitable for those who can afford to wait some time for the result and causing less inconvenience and disturbance of ordinary occupations than other methods.

After needling, the other eye should not be used for exacting work during the period of reaction, but it need not be closed, and even the operated eye is better freed from all dressings within twenty-four hours. Jackson uses discission in cases of cataract even in patients over forty years of age, and has so treated cases successfully.

In young children, three operations are necessary, and the desired result is not to be looked for within six months, while in older patients more than three operations may be necessary and the result is reached in a year. At the first operation, Knapp's knife or Bowman's lance-headed stop-needle is introduced in the limbus and plunged straight into the centre of the lens nucleus and then directly withdrawn along the path of entrance. This operation serves to reveal the power of reaction of the patient, and acts as a guide to the amount of further interference. After one or two months, the operation is repeated, this time breaking up the nucleus without necessarily enlarging the capsule opening. After waiting until very decided shrinking of the lens has taken place, a third operation is performed, in which both anterior and posterior capsules are cut through with a knife-needle of the Hays-Ziegler type. ROSA FORD.

(3) **Ewing,** of St. Louis, has invented a somewhat complicated-looking instrument of the nature of a forceps, to the limbs of which various forms of loops and hooks may be attached and mechanically rotated with a view to the removal of the lens in its capsule. A drawing illustrates the instrument. One judges from the text that the instrument has not, so far, been used on human eyes, but that experiments have been made with it on the eyes of animals. From these it appears to be of a practical character. ERNEST THOMSON.

(4) **Harbridge** gives the history of seven very unfortunate cases, and whilst being careful to say that they are not to be taken as contra-indicating operative interference, he yet draws the moral that the operation for extraction

is a severe shock to the general economy of the aged. He considers that it is easy to be too aggressive in this field. R. H. ELLIOT.

(5) **Darier**, of Paris, recurs to his method of covering wounds with a conjunctival flap as described in his "Leçons de Thérapeutique Oculaire," 1902. He has found this method the best. It is that in which the conjunctiva is dissected up from the limbus towards the cul-de-sac in the form of a pocket, assisted, if necessary, by the freeing incision further out, as recommended by Kuhnt. By dissecting the conjunctiva for half its corneal circumference, for instance, from the internal to the external rectus, one third of the cornea can be covered with the flap without drag on the stitches. If more than this is to be covered, the Kuhnt incision should be made.

When the case is one of traumatism or ulcer of the cornea, the edges of the latter should be refreshed either instrumentally or by the cautery, tincture of iodine, or silver nitrate, before the conjunctival flap is drawn down over it. ERNEST THOMSON.

(6) **Friedenberg**, of New York, prefers to make his conjunctival flap by injecting an anæsthetic fluid into the region of the section before making the latter. He finds that by making a bleb in this way it is easier to form the flap with certainty. Personally, Friedenberg cuts the flap and delivers the lens in the usual way, but the flap procedure can be modified slightly to allow of subconjunctival extraction of the lens. For this purpose the section of the cornea is carried out as usual, but the knife is swept for a distance under the conjunctiva, forming a pocket, and is withdrawn without detaching the conjunctival flap. The lens can now be delivered into this pocket and allowed to escape through the side slit, or another made with scissors, if necessary. ERNEST THOMSON.

(7) **Jocqs**, of Paris, asks the question whether those traumatic cataracts in which the opening in the capsule is small and which progress only slowly to completeness, should be operated on or left alone. He holds with Bourgeois, and against Armaignac and Santos Fernandez, that in young adults the cataract should be got rid of as quickly as possible and not left too long to itself. Of course, as far as possible, operation should be avoided on an incomplete cataract or in an irritable eye, but if a cataract is becoming complete too slowly, Jocqs operates in two stages. In the first, he draws off as much of the lens as will come away, and in the second, expects to clear the pupil. One must not forget, he says, that certain incomplete traumatic cataracts (rosette form in the posterior layers) following a contusion or even the penetration of a foreign body which has been extracted, may disappear almost completely without absorption of the lens. Such cataracts do not enter into the present consideration. ERNEST THOMSON.

(8) **Truc**, of Montpellier, writes at considerable length about extraction of cataract with the conjunctival flap made in the usual way, as opposed to the large bridge-flap which remains attached above. S. E.

(9) **Bonnaud**, of Roanne, after making the naïf remark that he has no intention of solving the question (*trancher la question*) of iridectomy or no iridectomy in the extraction of cataract, nor yet of insisting on his own point of view, nevertheless proceeds to make a strong special pleading of the case for operation without iridectomy. The author does not seem to make any points beyond those which are already well known, practically all of which admit of argument by those who favour iridectomy. ERNEST THOMSON.

(10) The Shikarpur Eye Hospital, in connection with the Quetta Medical Mission, is open only for two months each cold season, during which three surgeons and their assistants work at high pressure. The so-called "in-patients" are accommodated in shelters outside the hospital buildings.

Some 800 cataracts were extracted in their capsules by Smith's method, while 180 extractions were performed with capsulotomy. The proportion of intra-capsular operations would have been higher, probably 95 per cent, if all the operators had been sufficiently experienced. This method is the more suited to the great rush of work at Shikapur. The economy in time and dressings is enormous. As a rule, the dressing is changed once only, *viz.*, on the fifth day. Another great advantage is the short stay in hospital. Uneducated patients become restive if kept in hospital long. The paper deals with general impressions rather than with actual results.

Holland, of Quetta, does not feel quite satisfied with the practice of leaving the eye uninspected for from four to six days. There were "at least three cases" of loss of the eye from sepsis, in which the patients complained of no pain at all, and yet on removing the bandage, pus was found "streaming out" of the eye. Douching with 1 in 2,000 perchloride lotion was practised, apparently after the cocain instillation, but without any system of measurement by time or by quantity. H. HERBERT.

(11) **Major Baird's** 1,137 intra-capsular extractions, performed in 1912 and 1913, include all those done by him since he began to operate by this method exclusively. He adheres as closely to Smith's *technique* as he is able to do, never having seen Smith operate. When he has attempted to alter the *technique* in any way, he has usually had cause to regret it.

There were 112 vitreous escapes, nearly 10 per cent. This high percentage is explained as being partly due to want of skill in the earlier days. But nearly half the losses occurred during or immediately after the making of the incision, and so would have occurred equally with extra- as with intra-capsular extraction. Baird is unable to understand why the text books recommend sawing movements in cutting the section. He infinitely prefers to complete the section in one thrust of the knife, or in a single thrust and withdrawal motion, as Smith does. Apparently, it has not struck him that the force necessarily used in his cutting, much greater than in gentle to-and-fro movements, supplies a ready explanation of many of his vitreous accidents.

In 56 cases, nearly 5 per cent., capsule was left behind. Generally, this happened in dealing with large intumescent lenses, the capsule rupturing during unsuccessful efforts to "somersault" the lenses. He would advise beginners not to operate on these swollen lenses with tense capsules. A large percentage of these accidents resulted in iritis and dense after-cataract.

The majority of the operations, 959 of the total 1137, were performed in outlying district dispensaries. The after-treatment was then entirely in the hands of subordinates, who supplied reports of the results. There were only 2·6 per cent. of failures reported in this series, to compare with 6·1 per cent. of failures in the series of 178 cases under Baird's own observation. Of the failures of this latter (verified) series, eleven in number, five were due to sepsis, five to iritis and dense after-cataract, and one to choroidal hæmorrhage.

Baird was able, subsequently, to examine 147 eyes of the larger series. The condition of the pupil is given in 118 eyes, in which iridectomy had been performed. The pupil was central in 99 eyes, slightly drawn up in 14, and much drawn up in 5.

For district work of this kind the intra-capsular method is peculiarly applicable, in that it requires little or no after-treatment. The patients certainly appear to appreciate it. The question as to which is the better operation is rapidly being settled by the patients themselves, who are gradually coming to resort more and more to those districts where the capsule is not intentionally ruptured. H. HERBERT.

(12) **Colonel Newman** employed McKeown's irrigator in 93 out of 102

consecutive extractions. He uses a nozzle with a lateral slit-like opening, instead of the ordinary terminal one. The nozzle is therefore held transversely in the wound, to give this required downward current in the anterior chamber. Thus, there is no danger of accident from the eye rolling upwards. The nozzles being slightly curved, two are required, one for the right and one for the left eye. H. HERBERT.

XIV.—INSTRUMENTS.

(1) **Ewing, A. E.**—Toothed scissors for the lens capsule abscission. *American Journal of Ophthalmology*, May, 1911.

(2) **Shumway, Edward A.**—The strabismus hook—a useful instrument in extirpation of the lacrymal sac. *Annals of Ophthalmology*, Vol. XX, July, 1911.

(3) **Ewing, Arthur E.**—The broad Keratome in the removal of a dislocated lens. *Ophthalmic Record*, November, 1911.

(4) **Ehrhardt, Anna.**—A new lid clamp. *American Journal of Ophthalmology*, February, 1912.

(5) **Shahan, W. E.**—A simple lacrimal syringe. *American Journal of Ophthalmology*, February, 1912.

(6) **Brawley, Frank.**—A new knife. *Ophthalmic Record*, March, 1912.

(7) **Hasse, Wilhelm.**—Stiletto needle for removing foreign bodies from the cornea and for similar operations. (Stiletnadel zur Entfernen von Fremdkörpern aus der Hornhaut und zu ähnlichen Manipulationen.) *Klin. Monatsbl. f. Augenheilkunde*, Mai, 1912.

(8) **Bardsley, P. C.**—Bardsley's sclerectome. *Transactions Ophthalmological Society U.K.*, Fasc. 3, 1912.

(9) **Allport, Frank.**—A modification of the Prince advancement forceps. *Ophthalmic Record*, November, 1912.

(10) **Ewing, A. E.**—Mandible capsule forceps. *American Journal of Ophthalmology*, May, 1913.

(11) **Bey, Sameh.**—Some modifications of surgical eye instruments. (Quelques instruments de chirurgie oculaire modifiés.) *La Clinique Ophtalmologique*, mai, 1913.

(12) **Allport, Frank.**—Fixation forceps. *Ophthalmic Record*, August, 1913.

(13) **Rollet, E.**—A scleral trepan. (Un trépan scléral.) *Revue Générale d'Ophtalmologie*, 31 décembre, 1913.

(1) **Ewing**, of St. Louis, has invented a pair of scissors, a figure of which is given in his article, intended for the removal of a central piece of the capsule in cataract extraction.

(2) **Shumway** has found the strabismus hook passed into the lacrymal sac an excellent guide, and one which facilitates the removal of the sac. He has used this method since 1910.

The reviewer can strongly recommend this method as one which enables the surgeon to remove the sac quickly, and, what is more important, in its entirety. He has used the strabismus hook for the past four years.

JOHN WHARTON.

(3) **Ewing**, of St. Louis, successfully removed a lens, partially dislocated into the anterior chamber, through an incision in the corneo-scleral margin, on the temporal side, made by means of a broad (not less than 12.5 mm.) lance-shaped keratome, the blade being passed behind the lens, so as to fix it by pressure against the cornea. By applying pressure on the nasal part of the cornea, the lens was forced through the wound on the anterior surface of the knife as the latter was slowly withdrawn. J. JAMESON EVANS.

(4) **Nurse Anna Ehrhardt**, of the New York Eye and Ear Infirmary, describes and figures a lid clamp especially designed for the operation of excision of the tarsus. It is also useful for any operation in which double eversion of the upper lid is called for.

(5) A very simple and ingenious lacrymal syringe, which is said to have shown a high degree of efficiency in practical application, is described and figured by **Shahan**, of St. Louis. It consists essentially of an ordinary glass dropping tube, 82 mm. or so in length, into the small end of which is fused a piece of platinum tubing. Platinum or platino-iridium tubing is better for the purpose than either gold or silver tubing, because, in the first place, the latter have too low a melting point, and, in the second place, because, owing to the approximate equality of the coefficients of expansion of glass and platinum, the glass does not crack around the metal during marked changes in temperature, as in boiling. The great advantage of these syringes, apart from their easy sterilizability and their general handiness, is that the surgeon makes the syringes for himself in various shapes and with points of various calibre. The author gives exact instructions how to go about making a syringe out of the three common commercial articles, glass tubing, platinum tubing, and a rubber teat ; although anyone, we should think, after a little experimentation, ought to be able to turn out the article easily enough. These syringes can be used for other purposes, such as washing out the anterior chamber. If for any purpose the rubber teat is not large enough, a photographic shutter-bulb can be employed. ERNEST THOMSON.

(6) The knife devised by **Brawley**, of Chicago, is intended for dividing thickened lens capsule and for iridectomy. The blade is the same size as Ziegler's knife, but the point is more strongly curved and is very sharp. The remainder of the blade is sinuous, the better to hold the object, which is cut with a sawing motion. The knife should be introduced into the eye as if it were a sharp hook. J. JAMESON EVANS.

(7) The stiletto needle described by **Haase,** of Homburg, has been found particularly useful for removing foreign bodies firmly imbedded in the cornea. It is made by Wurach, Berlin, and can be used with the illuminating attachment of the author. A. J. BALLANTYNE.

(8) The instrument devised by **Bardsley,** of London, is intended to simplify the operation of trephining for glaucoma. It is a compound instrument consisting of two parts, (1) a right-angled, narrow-bladed keratome with a hole drilled through the blade, (2) a punch attached to the handle of the keratome, which, worked by a lever and ratchet, descends into the hole. After making the usual conjunctival flap, the keratome is passed into the anterior chamber through the sclera until the piece of sclera in front of the cut comes under the punch. The lever is then pressed and the punch removes a circular piece out of the sclera. The punched-out piece is removed along with the keratome blade—a very important point, since the risk of losing

the disc in the anterior chamber is thereby abolished. A peripheral iridectomy can be done through the keratome opening. The instrument is figured. ERNEST THOMSON.

(9 **Allport**, of Chicago, has modified Prince's forceps by making them smaller and lighter, and one blade has fine comb-like teeth which pass through an elongated slot in the other blade when the instrument is closed. "Once the soft tissues are engaged between these two jaws and the forceps closed by the snap, they will not open until released by the operator."

J. JAMESON EVANS.

(10) **Ewing**, of St. Louis, describes a modification of the capsule forceps which he described and figured in the December, 1912, number of the *American Journal of Ophthalmology*. Since appreciation of the instrument practically depends on a study of the figures, the reader must be referred to the original. ERNEST THOMSON.

(11) **Sameh Bey's** modifications of a number of instruments, as the result of large surgical practice, were shown at a meeting of the Egyptian Ophthalmological Society on March 1st, 1913.

(12) The fixation forceps, devised by **Allport**, of Chicago, are intended to be valuable in cataract, iridectomy, etc., especially if the conjunctiva is friable. They are small and slender, have no catch, the fixation ends are rounded, the inside of the ends have no teeth, but are serrated.

J. JAMESON EVANS.

(13) The reviewer is not quite able to follow the distinction made by **Rollet**, of Lyons, between the trepan and the trephine.* At any rate, Rollet does not like the Elliot trephine, and has invented an instrument which he refers to as a trepan, not a trephine. It is constructed with the handle at right angles to the cutting tube and is worked by a screw. It looks in the drawing a complicated and cumbrous instrument compared with the simplicity of the trephine used in this country, and one finds it difficult to think it preferable. That, however, is purely a matter of opinion. S. E.

XV.—REMEDIES.

(*Eighth Notice.*)

(1) **van Doren.—On the employment of fibrolysin in eye work. (De l'emploi de la fibrolysine en oculistique.)** *Arch. Méd. Belges*, août, 1912.

(2) **Matagne.—Radium in ophthalmology. (Le radium en ophtalmologie.)** *Ann. de la Policlinique Centrale*, novembre, 1912.

(3) **Bayer, H.—Further researches upon spring catarrh. (Weitere Untersuchungen auf dem Gebiete des Fruhjahrskatarrhs.)** *Neununddreissig Bericht der Ophthalmologischen Gesellschaft*, Heidelberg, 1913, p. 271.

(4) **Cirincione, Specialeo (Roma).—The surgical treatment for the cure of hypopion - keratitis. (Metodo di cura chirurgica per la guarigione della cheratite con ipopio.)** *La Clinica Oculistica*, Gennaio, 1914.

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*A "trephine" has a central pin to fix the instrument. Scleral "trephines," which have no central point, are strictly speaking, "trepans" and not "trephines."—EDITOR.

(5) **Mattice, Albert F.—Successful treatment of an epithelioma of the cornea with radium.** *Arch. of Ophthalmology*, No. 3, May, 1914.

(6) **Henry, John P.—Phagocytic treatment of diseases of the eye and ear.** *Lancet*, May 30th, 1914.

(7) **Harry, Philip A.—Traumatic exfoliative keratitis.** *Lancet*, June 13th, 1914.

(1) **Doren** obtained great improvement in one case of cicatricial adhesions of the upper eyelid and in another of cicatricial entropion by means of injections of fibrolysin. He obtained no benefit in cases of leucoma, but the results were happier in recent corneal infiltrations and in parenchymatous keratitis. Vitreous opacities were favourably influenced, but the results were *nil* in old-standing iritic exudates. MARCEL DANIS.

(2) According to **Matagne**, eczema, angioma, nævus, lupus and malignant tumours of the eyelids, as well as trachoma, spring catarrh, pterygium, and epithelioma of the conjunctiva, to say nothing of ulcers of the cornea and leucomata, are all favourably influenced by radium. MARCEL DANIS.

(3) **Beyer,** of Freiburg i. Br., read a paper to the Heidelberg Congress in 1912, in which he described and illustrated by a coloured drawing the effect of excluding the air without keeping out the light from eyes affected with spring catarrh.

He read a second paper to the Congress in 1913 narrating his efforts to elucidate the *rationale* of the procedure. His experiments have so far been inconclusive, but further experience has only served to confirm his view that the disease is favourably influenced by excluding air. Beyer lays stress upon the value of Trantas' points in making a differential diagnosis.

Fuchs, of Vienna, agreed with Beyer that light was not the cause of the disease. He thought that it was caused by some unknown infection.

The writer of this abstract has tried the effect of Beyer's goggles upon a severe case of spring catarrh confined to the tarsal conjunctiva, and accompanied with much lacrymation and photophobia. The effect was very doubtful, but the case was cured by two applications of radium.

T. HARRISON BUTLER.

(4) The experiments of Calderaro and of **Cirincione** himself have led the latter to certain conclusions: (1) that the organism, isolated from a case of hypopion, cannot produce by itself a hypopion-ulcer when inoculated into another eye. It gives rise to a grey infiltration, of more or less intensity, which has always a favourable course; (2) that the intensity of this infiltration is directly proportional to the quantity of the culture inoculated, and has little relation to the nature of the organism.

In one case, in which the cornea was insensitive, the course was the same, but when, after the first healing, another inoculation was made, it was followed by a definite hypopion-ulcer.

Cirincione is convinced that, in many cases at least, the infection by the staphylococcus or diplococcus is a secondary one, and that a primary destruction of the corneal tissue is needed before the secondary and more destructive infection can occur. He thinks that the chief cause, in fact, is the continuous reinfection of the ulcer from germs in the conjunctival sac. If, therefore, we can cut off this source of infection from the cornea, we shall probably be able to bring about a cure; in so far as any treatment agrees with these *desiderata*, so far is it likely to be effective.

He begins by treatment of the conjunctiva and lacrymal passages; he then touches the ulcer with the electro-cautery; then he detaches the conjunctiva all round the cornea; trephines the sclero-corneal junction with the object of keeping the intra-ocular tension low, and sutures the conjunctiva over the cornea, taking care that the sutures do not touch the cornea in any place. The edges of the conjunctival folds should be held in contact for ten days; when they are freed, they fall back to the margin of the cornea. HAROLD GRIMSDALE.

(5) **Mattice**, of New York, summarises Koster's work with radium, and then gives notes of a case of what he claims (in the absence of microscopic examination) was an epithelioma of the cornea. The tumour disappeared entirely under the influence of three applications of radium, and no recurrence had occurred during the five months the patient was kept under observation. Details of the treatment are given. R. H. ELLIOT.

(6) **Henry**, of Galway, speaks highly of the phagocytic action of nuclein. He relates, in particular, a case of hypopion-keratitis in which all operative treatment was refused. This case got quickly better on the administration of two two-grain capsules of nuclein (Parke, Davis, and Co.), thrice daily. The author says: "This is but one case of many in which I have found nuclein of decided benefit. If taken in time it aborts styes, boils, acne pustules, acute otitis, coryza, influenza, enlarged glands, gingivitis, incipient dental abscess, etc. Even when suppuration has occurred, it frequently happens that, under the action of nuclein, the inflammation subsides and the pus absorbs. It has a beneficial action on keratitis, iritis, dacryocystitis, and, in a lesser degree, on conjunctivitis and chronic middle ear disease." ERNEST THOMSON.

(7) **Harry,** of Rochdale, describes the characteristics of a series of six cases—in twelve months—of traumatic exfoliative keratitis. He then states a theory as to the cause of the exfoliation, and offers a treatment based thereon.

The theory is that at the site of the erosion a toxin is formed by the micro-organisms introduced by the original injuring body. In all the cases the abrasion was produced tangentially to the surface, so that there was probability of the lodgment of organisms under a flap of epithelium. The toxin, although unable to penetrate Bowman's membrane, can spread along its surface, producing exfoliation up to a certain point. When the changes produced by the toxin on the epithelium cells have progressed for some time, as during sleep, the friction produced by opening the lids will ruffle the epithelium and cause the sharp stabbing pain of which patients complain.

The treatment is as follows.—The conjunctival sac is anæsthetised and douched with normal saline. By means of a Bowman's needle, several oblique punctures are made into the anterior chamber at and around the seat of the trauma. On each occasion, before withdrawing the needle, it is turned at right angles on itself to allow the antibody containing aqueous to escape slowly. As a rule, the epithelium is raised from Bowman's membrane by the fluid. This, says the author, together with the use of weak peroxide of hydrogen lotion and 2 per cent. chloretone in parolene drops, is sufficient to produce a cure and to prevent relapses.

ERNEST THOMSON.

BOOK NOTICES.

Taschenbuch der Augenheilkunde für Aerzte und Studierende. By DR. CURT ADAM, Berlin. Third enlarged and improved edition; 395 pages; 71 text illustrations; 5 plates, four of which are coloured. Vienna: 1, Maximilianstrasse, iv; Urban und Schwarzenberg. Price 8 Marks.

We have given already very favourable notice to the English translation, by Sym and Lithgow, of the second edition of Dr. Curt Adam's book (See THE OPHTHALMOSCOPE, 1911, p. 301).

The title of the present edition is somewhat different from that of its two forerunners (*Therapeutisches Taschenbuch für die Augenpraxis*). This is accounted for by the decision of the author to introduce a greater amount of "Diagnosis" than was to be found in the earlier editions. At the same time, in essentials, the book is not greatly altered. Obviously, it is brought up to date, a fact which emerges prominently if one glances at the treatment of syphilis. The illustrations are more numerous, and now include a few fine coloured plates. At the end of the book are some chapters dealing with institutions for the blind, with Army and Navy requirements, and so on, which are of interest, more particularly, of course, to Germans.

We welcome very heartily this third and improved edition of Dr. Adam's book, and hope that it also may be rendered of service to British students by appearing in due course under an English title. ERNEST THOMSON.

The American Encyclopedia and Dictionary of Ophthalmology. Edited by CASEY A. WOOD, assisted by a large staff of collaborators. Volume III, Cataract in Diabetes to Cocaine Carbolate. Chicago: Cleveland Press, 1914.

The third volume of the *American Encyclopedia of Ophthalmology* is a particularly important one.

The principal articles are those on senile cataract—which alone occupies nearly two hundred pages—and on intra-capsular extraction of cataract; a pithy and very interesting account of the ocular relations of the cavernous sinus; a long and elaborate article on the ocular relations of the neighbouring cavities (in which is included a good deal of operative detail); a comprehensive one on choked disc, in which much British work is recognised; and a series of articles on the choroid. Tumours of the choroid are included in the last-named.

The reviewer, in despair at the mass of reading which would be necessary in order properly to review such a volume, has contented himself with a study of the article which he considers of greatest importance, that, namely, on senile cataract. This is very complete, and taken along with all the other work on cataract in this volume and Volume II, should serve as a standard for many a day. If one want history, here it is. If one require to know the exact pattern of knife which was used or is used by a particular surgeon, the illustration is here. Should one be interested in the various types of corneal section, there are diagrams of every known section. So also with capsulotomies and with other details. The newest operations receive full attention and detailed description.

But on the other hand, and in consequence mainly of this great completeness, the reviewer has found the article indigestible. Given only this one book in which to study the *practical* cataract operation, one would be perplexed. The avowed intention of the writer of the article is to consider " not only the manipulations and instrumentations in their regular order, but to set down—at the time and place they generally occur—those deviations from the straight path of normal cataract extraction that every well-informed operator should bear in mind." As a result, the mass of detail is so great, the by-paths which lure the author along are so numerous, that, to continue the metaphor in a well-worn phrase, " there is difficulty in seeing the wood for the trees." It may be said that in an Encyclopedia such a difficulty hardly matters. That is true, provided one has marks by which any particular tree can be found. In the opinion of the reviewer, the course adopted is open to the objection that, in the absence of an index, such as would exist in a text-book, there is difficulty in finding quickly what one wishes to know. The article is unsigned.

ERNEST THOMSON.

Transactions of the Eighteenth Annual Meeting of the American Academy of Ophthalmology and Oto-Laryngology. 1913.

These *Transactions*, which contain the proceedings of the American Academy of Ophthalmology and Oto-Laryngology at the meeting held on October 27th and 29th last at Chattanooga, Tenn., have just reached us.

The volume is divided into two parts, the one dealing with Oto-Laryngology and the other with Ophthalmology. As regards the last-named it includes the oration delivered by Col. R. H. Elliot on " Corneo-Scleral Trephining," and communications on the same subject by Wendell Reber* (Philadelphia), and Nils Remman (Chicago). Communications dealing with allied subjects were read by Samuel D. Risley* (Philadelphia), and Robert Scott Lamb (Washington). A good discussion took place upon these several communications.

The volume is adequately illustrated. SYDNEY STEPHENSON.

Anatomy and Physiology of the Eye and its Appendages. By JOHN WELSH CROSKEY, M.D., Ophthalmic Surgeon to the Philadelphia General Hospital. Philadelphia: Smith-Edwards Company, 129 North 12th Street. Price not stated.

From time to time we receive at the office of THE OPHTHALMOSCOPE productions of various kinds accompanied by a request for a review, productions which we would much rather allow to pass unnoticed. This pamphlet is one of the type.

We find it exceedingly difficult to understand the confidence of an author who states in the preface his belief " that if the anatomy of the eye is thoroughly understood, it renders subsequent study less difficult," and who yet considers that this *desideratum* is fulfilled in eighteen pages of print containing, at the lowest computation, a score of textual errors such as " Descement's membrane," " consenual action," " palperbral," " ethmodial," " trochlaris," " conjuctiva," " zonula cilaris," to say nothing of two coloured plates one of which shows the " canal of Fontana " as a space between the ciliary body and the sclerotic, and represents a (presumably) adult eye as containing a full-blown artery in the hyaloid canal. After that, we are not surprised to find that " the function of the lens is to enable us to see distinctly all objects within the range of vision, no matter at what distance." In view of the class of millinery lately in vogue, the unconscious humour of the following sentences would be very hard to match.—"We can easily convince ourselves that the normal eye possesses such a power (accommodation), when we go to a base-ball game and sit back of the wire screen. We cannot see the screen and the player at one and the same time. Another proof is found in the veils worn by women." The last sentence contains a wonderful truth, although doubtless the author intended that the observation should be made from the standpoint of the lady.

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*These communications have already been published in the columns of THE OPHTHALMOSCOPE.

CORRESPONDENCE.

[While THE OPHTHALMOSCOPE will at all times welcome correspondence from its readers, the Editor does not hold himself responsible for any views expressed in this column.]

THE OXFORD DIPLOMA IN OPHTHALMOLOGY.

To the Editor of THE OPHTHALMOSCOPE.

DEAR SIR.—In the July number of THE OPHTHALMOSCOPE there is a review of a paper by Dr. Freeland Fergus, published in the *Glasgow Medical Journal*, July, 1913, in which he has made some criticisms of the Diploma in Ophthalmology granted by Oxford University. He is reported as saying, "that the standard required, if judged by one of the books which has been issued for the instruction of graduates preparing for the examination, is 'deplorable.'" Dr. Fergus does not mention the name of the book, but if he is referring to a small handbook of pathology written by myself, I should like to point out that this does not pretend to represent the whole of the pathological knowledge required by a candidate, or anything like it. We frequently find men, who, in spite of the required year's clinical work at recognised eye departments and hospitals, do not know the separate parts of an eye when seen under a microscope, and it is useless for a man under these circumstances, to start with one of the big text-books of ocular pathology, admirable as they are, until he has gained some elementary knowledge of his subject. It was with the idea of helping these men that the book was published, and not in any way as covering the syllabus of the work required. It would be just as fair to criticise the Honours School of History, because someone connected with the University ventured to produce an elementary book on the subject.

The only other book published that I know of in any way connected with the Diploma, is one on physiological optics, by the late Dr. Burch. This book contains instructions for the performance of the practical experiments undertaken by the class, and I presume is not the book to which Dr. Fergus refers; but anyhow, owing to the unfortunate death of the author, it is not now used in the class.

I should like to state that the Diploma class have a complete practical course in bacteriology and clinical pathology in the University laboratory, as well as a course in ocular pathology, and also to confirm what your reviewer states, that the standard required in the examination is a high one.

It is our fixed intention to maintain this high standard, and this of itself appears to me to justify the existence of the qualification.

Yours truly,
P. H. ADAMS,
Margaret Ogilvie Reader in Ophthalmology.

53, BROAD STREET, OXFORD.
July 11*th*, 1914.

NOTES AND ECHOES.

Obituary.

WITH much regret we have to announce the death of Emil Gruening, aged 72 years, which took place on May 30th last. He was the *doyen* of New York's ophthalmic surgeons. He was a past president of the American Ophthalmological Society. Gruening had deservedly the reputation of being exceedingly well read in the literature of his speciality, although his own contributions in that direction were not perhaps specially numerous. It was Gruening, however, who first drew attention to the danger of blindness from wood alcohol. He was the possessor of a very pretty wit. The tale has often been told of Gruening's question addressed to a colleague at a medical society who exhibited the results of a plastic operation about the lids. "It would be interesting to learn," said Gruening, "whether this is shown as an instance of success or of failure."

The whole of the April number of the *American Journal of Ophthalmology* is taken up with a series of articles relating to the life and work of one who was probably less well-known in this country than he deserved to be, the late Dr. John Green, of St. Louis. Articles are communicated by Drs. F. A. Hall, W. E. Fischel, E. A. Engler, A. E. Ewing, and William Trelease.

* * * *

Tests for Eye-sight.

FOR the purpose of formulating concerted action against the eyesight test and the system of promotion on the North-Eastern Railway, a conference has been called at Darlington on August 23rd.

* * * *

Ophthalmia Neonatorum.

IT is satisfactory to note that the Central Midwives Board shows no signs of laxity in dealing with midwives who neglect to follow the Board's rules with regard to the prevention of ophthalmia neonatorum. For example, at a recent meeting, a midwife was struck off the roll for remissness in that direction. The woman was dealt with because in a case where the baby's eyes discharged, she did not explain that medical attention was required, nor did she give to the relatives the proper form enjoined by the Board's rule E.20 (5).

* * * *

Ophthalmic Prize.

IT is announced that the prize of 5,000 francs offered through the *Annales d'Oculistique* for the best work on the ætiology, prophylaxis, and treatment of the forms of irido-cyclitis (not due to syphilis) will be awarded this year. Memoirs in competition, which may be in French, English, or German, must reach the offices of our contemporary (26, Bd. Raspail, Paris) not later than August 15th next. Readers of THE OPHTHALMOSCOPE will recall the fact that in order to be admissible, competing essays must have been presented to one of the Ophthalmological Societies of France or elsewhere.

* * * *

Mercantile Marine: Sight Tests.

THE Board of Trade has now isssued a report on the new sight tests used in the Mercantile Marine. This report covers the period of April 1st to December 31st, 1913. An improved wool test, in which the candidate has to match five colours, and a lantern test were used. The cases of colour blindness are divided into those definitely rejected by the local examiners and those referred for a special examination, the local examiner being doubtful. Of the 286 definitely rejected in the local examinations 148 failed in both the lantern and the wool test and 138 failed in the lantern test only; there was no failure with the wool test which passed the lantern test. Of the 286, 93 appealed, 26 being successful. Of 125 referred cases, 20 were referred on both the lantern and wools, 101 on the lantern only, 3 on the wools only, and 1 on form vision as well. Of this number there were 30 failures, 3 of these were referred on both the lantern and wool test, 26 on the lantern only, and 1 on form vision as well. Those referred on the wool test alone were passed.

* * * *

The Workmen's Compensation Act.

THE Midland Ophthalmological Society, at a special meeting held on June 30th last, unanimously passed the following resolutions:—

(1) It is desirable that in every case under the Workmen's Compensation Act a minimum fee of two guineas be charged for a first examination and report, whether on behalf of the applicant or the respondent.

(2) The Members present at this meeting undertake to act upon the foregoing resolution until further notice.

(3) That the Officers of the Society be requested to draft an explanatory letter embodying these resolutions, and send it to every Member of the Society with a request for a reply.

* * * *

Oxford Ophthalmological Congress.

AN account of the last meeting of the Oxford Ophthalmological Congress (July 9th and 10th, 1914), which was brighter and better attended than ever, will be found in another part of the present number of THE OPHTHALMOSCOPE (see p. 276).

* * * *

Appointments.

WILFRED HARRIS has been appointed physician to the Royal Westminster Ophthalmic Hospital, London.

Duncan Matheson Mackay has been appointed honorary ophthalmic surgeon to the Hull Royal Infirmary.

William Bainbridge has been appointed assistant ophthalmic surgeon to the Hull Royal Infirmary.

T. Milnes Bride has been appointed surgeon to the Manchester Royal Eye Hospital.

Arthur Greene has been appointed honorary ophthalmic surgeon to Watt's Naval Training School, Norfolk.

Dr. Eugen v. Hippel, of Halle, has accepted a call to Göttingen, as successor to Professor Arthur v. Hippel, retired

Dr. Seefelder, of Leipsig, has been nominated extraordinary professor of ophthalmology.

* * * *

The late Professor v. Michel.

A BRONZE bust to the memory of von Michel, late director of the University Eye Clinic in Berlin, was unveiled by Professor Krückmann on July 5th last. It was presented by the students, friends, and colleagues of the deceased.

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THE OPHTHALMOSCOPE DIARY.

1914.

International Congress of Ophthalmology.	August 10th to August 15th	St. Petersburg.
American Academy of Ophthalmology and Oto-Laryngology	October 19th to October 21st	Boston, Mass.

1915.

Oxford Ophthalmological Congress	July	Oxford.

THE OPHTHALMOSCOPE.

A MONTHLY REVIEW OF CURRENT OPHTHALMOLOGY.

VOL. XII.—No. 9.] *SEPTEMBER 1, 1914.* [TWO SHILLINGS.

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ORIGINAL COMMUNICATIONS.

WORKMEN'S COMPENSATION IN EYE INJURIES.*

BY

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General Considerations.

"WORKMEN'S Compensation in Injuries of the Eye" is the subject of our discussion. The importance of the subject requires no emphasis, for since the Workmen's Compensation Act of 1906 came into force, oculists, in their public or private work, have had constantly to deal with patients coming under its *ægis*. It was different before that time when under the Common Law of England and Employer's Liability Acts actions for injuries were rare, and were successful only where negligence could be proved; and were settled, when successful, by payment of a lump sum. Now it is not necessary to prove negligence, and the injured receive weekly payments, not exceeding half the average wage, as long as inability to work remains.

It is stated that the Workmen's Compensation Act of 1906 affects about 20,000,000 out of a population of 45,000,000 people in these islands, and the number of claims is growing year by year and now numbers about half a million annually. The yearly increase in the number of claims is mostly due to more applications being made and paid for comparatively trifling accidents. The money-cost to the employer varies from about a half to one and a-half per cent. of his wages' bill, according to the degree of risk involved in each class of work. Whilst the Act has undoubtedly done much good to millions of people, like all beneficent Acts, it is abused by the unscrupulous and the lazy. One indirect effect has been to deplete to a considerable extent the accumulated funds of many Friendly Societies, for most workmen are members of one or more of such. Hence in many cases of injury workmen are receiving as much money, or nearly as much, whilst off work as when employed; and in a few cases, especially if resident in a hospital, they are even better off when in receipt of compensation than when at work. Now, hunger and the necessity of providing for dependents constitute the great stimulus to work for most humans. Can we wonder then that an injured workman when thus well provided for, unduly prolongs the period of his incapacity, or voluntarily in many cases declares he is not fit to work when he really is so?

Immediately the Act came into force, I was appointed by a Mutual Insurance Company formed by a group of employers, to examine *every* case of injury to their workmen as soon after the accident as possible, and later on during the progress of each case when necessary. In this way I examined many hundreds of injured men. I found that the great bulk of the men were honest in their claims; that many exaggerated their disability unconsciously and some consciously, and consequently received compensation for perhaps weeks or months longer than was necessary; but that the number of those who deliberately made fraudulent claims did not amount to more than a half to one per cent. of those hurt.

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*The opening paper of a discussion on the subject at the Oxford Ophthalmological Congress, 10th July, 1914.

The following figures are taken from the official return of the Home Office, and relate to claims made under the Workmen's Compensation Act in the year 1911. The total number of claims was 423,052 : of these 98·94 per cent. were settled out of Court and only 1·06 per cent. of the whole were decided in a Court of Law. Of the cases settled in Court, *viz.*, 4,487 cases, roughly four out of every five were decided in favour of the applicant and one in favour of the employer.

The employers account for the comparatively small number of cases brought into the Courts by the great cost of fighting unjust claims (£20 to £30 for each case), and the chance of winning being four to one against them. This being the case, the employer prefers to make the best of a bad bargain and settle the claim out of Court, if he can do so, although he knows quite well that he nearly always must pay more, and sometimes many times more, than the claimant is justly entitled to. On the other side, the reason may be alleged that the great bulk of the cases are settled amicably. The facts and figures just cited show how great is the new problem—new since 1906—which confronts all medical men ; for it is to them that both the employer and the employed (the terms "master" and "servant" are now almost extinct, since men became merely "hands") to aid them in settling these claims. And the new problem is—how far an injury which a workman has received interferes with his working power, and for what length of time will it incapacitate him? This is practically a new point of view to the surgeon.

We, however, as eye surgeons, are concerned only with injuries to the organs of vision of workmen which, arising "out of and in the course of their employment," cause inability to work or are alleged to do so. In some trades these accidents are, of course, more frequent than in others, but in most they seem to form a fair percentage of the total number of claims, at any rate so far as Court cases are concerned. Indeed, they seem to rival in point of numbers the claims made by those with "bad backs."

The Traumatic Neuroses and Malingering.

In opening this discussion I propose to devote some minutes to what I have found often to be the most difficult problem which presents itself to us in our work under the Workmen's Compensation Act, *viz.*, the occurrence of the traumatic neuroses and of malingering in eye injuries. It is, of course, the more difficult cases—those likely to come into Court—in which the opinion of an eye surgeon is generally sought, and he, as a rule, has little difficulty in deciding for himself how far any particular injury to the eye does or does not cause inability to work apart from the question of conscious or unconscious exaggeration of the symptoms, or the occurrence of traumatic neurasthenia. It is the cropping-up of these complicating conditions, which may be obvious to the eye surgeon himself, but the presence of which it is so difficult to prove to the satisfaction of the judge or referee. It is true that these nervous states are common to all injuries of the body, and are not therefore peculiar to eye injuries. But as the eye surgeon has fewer opportunities of studying these neuroses, it behoves him to have a clear grasp of them in his own mind before he ventures to describe them in a Court of Law and to prove their presence to others. I have on several occasions seen medical men at a loss when questioned on this subject in the witness box. I therefore make no apology for dealing with this part of the subject a little more fully than some may think necessary.

The increasing number of claims made, the increasing length of time the applicants are off work, and the large proportion of the applicants who suffer from the traumatic neuroses are largely dependent upon the payment of the compensation weekly instead of by a lump sum. In order to show how these results are produced, we must consider *the general effects of an accident on the body*, apart from any particular organic lesion of the eye itself.

The immediate result of an injury to the body, as Thorburn has pointed out, may be an attack of acute shock or of acute hysteria.

1. In an attack of **acute shock** the patient becomes collapsed, has a cold clammy skin ("cold sweats"), weak pulse, pale face, flaccid limbs, sinking at the pit of the stomach, inability to make any mental effort, and perhaps incontinence of urine or faeces. It is evident that these symptoms are produced by a functional derangement of those parts of the nervous system which regulate the general economy, together with an arrest of mental activity and volition. This state of acute shock Thorburn has named "acute neurasthenia," thus bringing it into line with the chronic neurasthenia which often is a later development in workmen's injuries, as we shall presently see.

2. In an **hysterical attack** there may be laughing, crying, shouting, or panic-fright; the patient may be stupefied and dreamy, or the imagination may be distorted and lead to the patient later describing events which exist solely in her imagination. These symptoms are those of a psychical and emotional disturbance and indicate a functional upset of some of the higher neurones of the brain.

It is evident that these two states are quite different the one from the other, and although they may both be present in the same patient, the symptoms can be classified, some in one group and some in the other. These immediate effects of an injury rarely, however, come under our notice.

Some time after an accident one of the two following chronic disturbances may develop:—

1. **Chronic neurasthenia**, or "**chronic shock**," the symptoms of which may be sensations of fatigue (the patient being easily tired), defective memory, inability to fix the attention on any subject, incapacity for work or business, irritability, insomnia and dreaming, dyspepsia, which in some cases may produce irregularity of the heart's action (pre-systoles), asthenopia, muscæ volitantes, dilatation of the pupils, pains, backaches, headaches, palpitations, tachycardia, giddiness, irritable reflexes, and in some cases loss of weight—all of which signs indicate a chronic depression of the general functions of the body comparable to those which occur in acute shock—the "acute neurasthenia" of Thorburn.

2. **Chronic hysteria**.—In this state the symptoms are more definite. There may be a complete or partial hemianæsthesia involving not only the skin but also the mucous membranes and the organs of hearing, vision, taste, and smell. The anæsthesia is often of the "glove" or "stocking-leg" type, and never corresponds to areas supplied by definite nerves, but is limited only by the patient's idea of her anatomy. In testing for anæsthesia, unconscious suggestion on the part of the medical examiner plays an important part. To ask a patient whether or not she feels a pin-prick is to suggest that she may not feel it. There may be paralysis, often monoplegic and generally not complete. There may be muscular spasms. Fits are now rare. The patient may not be aware of her symptoms, whereas the neurasthenic complains loudly of his.

The anæsthesia never completely abolishes the function of the part, *e.g.*, the hysteric may not be conscious that she sees objects falling on her blind area, but she avoids them. The concentric contraction of her visual field, even when it affects both eyes, never leads to any difficulty in orientation; and by means of prisms, &c., an hysterically blind eye can be shown to possess vision.

In fact, the patient sees, but does not see that she sees. The same may be said of feeling.

The defect, then, is evidently one of the brain above the level of the most complicated reflex actions, *viz.*, in the area of conscious perception, *i.e.*, in the mental area; and it is involuntary. If the symptoms were assumed, one would not expect them to conform to so few and such remarkable types.

Yet suggestibility is one of the characteristic traits of hysteria. Möbius defines this disease as a state in which ideas control the body and produce morbid changes in its functions. Other mental stigmata are: feebleness of will, changeableness, and waywardness, both as to symptoms, as well as to disposition and desires.

Of the cases of eye injuries which come before us, a very large proportion present the symptoms of chronic neurasthenia; in a few there are also hysterical symptoms. It is now universally recognised that these neuroses are not due either to concussion of the spine or of the brain, as was once thought, for the symptoms of these are quite different. Neither are they fraudulent, else the symptoms would not be so uniform. At the same time it is notorious that:—

1. In railway accidents such neuroses are common in passengers, who make claims for big sums in compensation.
2. A severe organic injury usually prevents the development of a neurosis.
3. Rapid recovery usually follows a payment of a lump sum in compensation.
4. In many cases no physical injury has been sustained—merely fright—a mental shock.
5. These neuroses do not occur in the owners of motor cars and their friends; nor after earthquakes.
6. Those asleep or drunk at the time of the accident, and children, rarely suffer.

These and similar facts tell us that the traumatic neuroses must have a mental or psychic basis and be due to the initial fright *plus* the subsequent mental attitude towards the question of compensation. They are, therefore, the more likely to develop when the accident occurs under terrifying conditions. In hysteria doubtless there are other factors into which we need not enter. In chronic neurasthenia the way in which the disease is developed shows it to be a mental disease and not an imposture. There is the initial shock, with its loss of nerve tone and feeling of weakness and inability to work. Then arises a fear for his own health in the future and the possible results to his family. His friends tell him of the disastrous results which have followed similar accidents; his doctor is doubtful, asks suggestive questions, and perhaps does not talk to him as "straight" as he should; his solictor deems it to be his duty to magnify any loss and suffering, and urges that no settlement be accepted unless the biggest sum is paid, which will cover all possible contingencies. The claim being made, the solicitor for the employer or insurance company adopts the opposite tactics, minimises the disability, puts questions, and makes suggestions which arouse anger and resentment. The medical examiner on the same side adopts a like plan. More examinations and consultations follow. The result of all these discussions and questions is that the symptoms become grossly exaggerated, and assume proportions alarming to the insured. Owing to the increasing mental disturbance set up by all these inquiries, and the suspense and excitement caused by the uncertain results of litigation, the monetary consideration becomes the ruling factor in the evolution of the neurosis. A weekly payment may be awarded so long as disability lasts—this only serves to keep this ruling factor constantly in the fore-front of the injured man's mind, and so the disease is prolonged indefinitely. A diminution of the weekly payment does not seem to provide a sufficient stimulus to return to work in many workmen who are lacking in energy, and in whom the thought of compensation has become a fixed idea, and the subjects of it do not realize that the results from which they are suffering arise not from the accident, but from the erroneous opinion which they have formed of the rights to which they are entitled, by persuading themselves that an income is necessarily due to them. Some workmen become obsessed with the idea that every accident occurring in the course of their work requires an indemnity. Brissaud says that this obsession is a new disease, and calls it "*sinistrosis.*" When, however, the monetary factor is eliminated by the payment of a lump sum in settlement, the neurosis passes away, for then, as Thorburn remarks, the lawyer ceases from troubling and the workman is at rest.

In only a small fraction—perhaps in one-half per cent. of all claims—the applicant is a downright malingerer, as previously stated.

When an applicant for compensation comes before us for examination and report, if he is the subject of one of the neuroses, it requires the greatest tact and patience to unravel the case.

The neurasthenic generally resents examination; complains loudly of his pains and disabilities; declares that your gentlest touch is roughness and gives him agony; contorts his features; declares that his vision is lost or is gradually deteriorating; that he cannot bear the light; gives contradictory answers to your various tests; complains of dazzling, lacrymation, light phenomena, as fluttering, fiery balls, and muscæ; or he says that objects disappear, tiredness coming on quickly, The difference in the behaviour of these claimants, making much out of little, from that of an ordinary patient anxious to get well, is most marked.

The hysteric may have some of the symptoms already mentioned. If there is hemianæsthesia, the corneal reflex may be weaker on that side and there may be amaurosis on the same side. There may be contraction of one or both visual fields, and it may be of Foerster's displacement type, *e.g.*, if the object is seen at 90° on the temporal side and disappears at 30° on the nasal side, it may be seen at 50° on the latter and vanish at 60° on the temporal side; therefore the appearing of an object is a greater stimulant than its disappearing. Paresis or contracture of ocular muscles may occur.

In all these cases the pains and disabilities complained of are out of all proportion to the physical defects found. Indeed, these latter may be trifling. The chief difficulty consists in winnowing the chaff from the wheat as regards symptoms, and the great, almost insuperable, difficulty of making it quite clear to the lay mind which are the symptoms resulting from the physical injury and which are those of psychic origin which have been superadded, and obsess the patient's mind, tapping his nervous force and rendering him bankrupt of it.

The malingerer may be loud in his complaints or he may be taciturn. One must not mistake mental dulness for awkwardness. A pretended blindness of one eye can generally be readily discovered by the various tests to be mentioned presently. If a malingerer declares he has lost the sight of an eye or that its visual field is contracted (and if he has no peripheral nerve or brain lesion), by throwing a light on the supposed blind area the pupil will contract, showing that the rogue lies. Mr. G. H. Pooley is devising an apparatus, like a perimeter, on which a small electric light is used for this test. A malingerer will not turn his face towards his own hand when asked to look at it, as a blind man does; and on attempting to touch or strike his cornea, he will close his lids involuntary; if he has only one eye which he states is nearly blind and refuses to read the test types, in addition to the above tests, one must rely on his general behaviour by which he can be often caught out; and on a careful examination of the eye externally and internally. The mirror and other tests, if he reads one or two lines of the distant type, will show his answers to be untruthful. His eyes may be inflamed by such practices as blowing tobacco smoke into them, violent rubbing, and the application of other irritants. He may use, or be given to use, atropine by his doctor. This I have in several cases known to be done for months. His *total* weekly income from all sources and his social conditions will show that he manages to live fairly well without work. A persistent malingerer often develops hysterical or neurasthenic symptoms. Prolonged absence from work in all cases of neuroses and in some others leads to a most pronounced moral degradation.

Having discussed somewhat fully the nervous complications of injuries to the eye, we turn to consider some of the more definite problems which the eye surgeon must help to solve.

The Report on an Injured Workman.

When an injured workman comes before us, we must remember that it is loss of earning power alone for which the workman receives compensation and that our report should be so unbiased that it might be given to either side (provided a second and adequate fee be paid for it).

I usually divide my report into (1) the applicant's statement, (2) the account of the conditions found on examination, and (3) my opinion on the case.

(1) *The applicant's statement* should contain a clear but brief account of the accident, what he did immediately afterwards, and when he first sought medical aid:

Recently an old man stated that he got one eye scratched with a piece of straw at work. Medical evidence showed that he did not apply for treatment for some weeks afterwards, when the eye was hopelessly lost from a septic ulcer, and that had early treatment been adopted, the eye would have been saved in all probability. This evidence, together with the fact that he had not given notice of the accident for some weeks, lost him his case in the County Court.

It should be noted, too, whether the alleged accident was one likely to cause the injury found on examination:

A joiner was working at a circular saw when (he stated) some small fragments of the wood flew up and struck him on the eye. On the following morning, a Sunday, he was found to have a ruptured eyeball with the lens lying under the conjunctiva. I reported that the accident, as described, was not likely to have caused such a severe injury. A watch was kept on his movements, and he was soon afterwards found in the police court having been concerned in a hand-to-hand fight with another man in a public-house, in which the injury had been received the night before he applied for treatment.

A medical man asked me to see a joiner who stated that whilst working with a circular saw, some particles of chips struck his eye and that since then particles of wood kept coming out from the inner side of the lower lid, one such nearly every day. His wife said she had seen some of the particles come out. The eyelid was much swollen, being œdematous, but a careful examination failed to find any particles of wood inside the lid or any sinus. In answer to inquiries, he said it was red wood that he was sawing, but the pill box which he produced contained a few bits of red but most were of white wood and were pieces of match stalks. I warned him that if he proceeded with his claim I should appear against him. He abandoned the claim.

Statements made by an injured workman at the time of examination may of course be given as evidence in the County Court.

The report should also state *seriatim* the reasons the injured man gives why he cannot work; and each of these reasons should be commented upon in the opinion. The examiner should ascertain the nature of the work, and the conditions under which it is carried on.

2. *The condition found on examination* should be clearly stated, in non-technical language, as far as possible. A sharp look-out should be kept for causes of inability to work other than that alleged :

A stone mason was offered a lump sum in compensation for the alleged loss of the sight of one eye. When I examined him, he had an inoperable cancer of the rectum and a small leucoma to the side of one pupil which would not have interfered with his work had he been otherwise capable of doing it.

The results of previous eye disease or injury, if present, and errors of refraction must be investigated and estimated ; *e.g.*, a man with a progressive disease of the eyes (say, chronic glaucoma), which will itself lead to blindness, sustains an injury resulting in immediate and permanent disability. In such a case there should be given an estimate of the length of time that must elapse before the disease (apart from the accident) will have rendered him unable to work, as clearly he is entitled to compensation during that period only. A similar estimate should be given if the injured workman is the subject of any other disease, such as diabetes, syphilis, heart disease, etc.

3. *The Opinion* should include a statement as to the connection between the alleged accident and the physical condition of the eye found on examination ; another as to whether the workman is wholly or partially or not at all disabled from work as a result of the accident ; together with an estimate of the future duration of any disability found to be present.

It must be remembered that disability from similar injuries varies with the age and the personality of the individual workman ; with the demands of various kinds of work upon the eye ; with the opinion of the employer upon the working capacity of the injured workman ; with the competitive ability of the workman ; and, lastly, with the state of the labour market.

Ophthalmic surgeons possess the most exact methods of examination, and can often express in figures the loss of working capacity more correctly than other surgeons. In forming the estimate of the loss of earning power, one cannot rely solely on the wages received after a serious loss as a correct guide. We should remember, too, that the victim should be made secure against the most unfavourable possibility of his condition. In this country no stated percentage of wages is allowed for loss of particular parts or organs, such as is the case in Germany.

The Problem of the One-Eyed.

Even where the remaining eye is normal, we must remember that :—

1. The central vision of one eye is somewhat less that of both together.

2. Optical pictures are less clear. This alone might disqualify some classes of workmen, where good and quick vision is needed.

3. One-sixth of the visual field is lost (more if the eye be sunken or the nose high), an important loss on scaffolds and among moving machinery.

4.—*There is a loss of Stereoscopic Vision.*—This is a serious loss, and may permanently disqualify from posts which require good binocular vision. A one-eyed man cannot judge proportionate sizes, estimate distances or depth, and, consequently, may hit his fingers when driving a nail or miss his footing when stepping across staging. He generally learns, however, to overcome these defects, especially if the eye be lost when young :

A young ships' riveter returned to work three weeks after losing one eye, although he had to go up ladders and on staging, but this was before the days of the Workmen's Compensation Act.

In later life, especially if the eye be suddenly lost, it is much more difficult, and a year may have to pass before much of the power is regained through education of the muscle-sense. The power of estimating distances *instantaneously*, however, is permanently lost.

The tests for binocular vision are numerous. The diaphragm test is one of the best, as, by using different sized letters, the vision in an injured eye can be measured. Hering's drop test is of little use, as the patient's answer may be designedly misleading. I often use Edridge-Green's bead test for colours, which, by diverting the attention to the different colours of the beads, enables one to judge the patient's ability to estimate distances by the way in which the beads are picked up by the forceps and placed into the respective holes. The stereoscope and Worth's amblyoscope, with parts of an object in one picture and the complementary parts in the other are excellent. The stereoscope should have open sides, so that the eyes may be easily watched by the examiner. A momentary closure of the supposed defective eye tells the malingerer what he should see in this and all the other tests. Some workmen have discovered this for themselves. Others have learned it by hearing the fact mentioned in the Courts—for some applicants attend the Courts when cases like their own are being heard in order " to pick up wrinkles "—and a few have been educated up to it by unscrupulous medical men, for such are occasionally found—as there are also such lawyers who " nurse " up these cases for the Courts. These parasites fatten on fraud for a season.

Other tests are: Maddox' rod test; the four-dot test of Worth; particoloured letters of red and black, putting the red glass in front of the good eye; and the similar test with words, the letters of which are alternately red and green; the pencil test; the candle test with a red and a green glass in a spectacle frame; the various diplopia tests made with prisms; and Harlan's test with a strong plus lens in front of the good eye and a weak minus lens in front of the pretended blind eye. Recently I have used a modification of the last test as follows: with the patient at the distant types, a spectacle frame with a weak convex lens was put in front of the good eye and nothing in front of the pretended blind eye; the man read 6/9; putting up stronger and stronger glasses over the good eye he still read 6/9; adding now an opaque glass in front of the pretended blind eye, he could no longer read 6/9 which showed that he must have read that line with the pretended blind eye. I have no experience of Pfalz's stereoscoptometer which is said to measure the disturbance.

One-eyed men frequently complain that the sight of the good eye deteriorates after loss of the first eye. Unless examination shows that there are definite physical changes in the defective eye such a claim cannot be allowed, although to the detriment of our reputation one hears occasionally a medical witness describe ophthalmoscopic changes, which are observable only by himself, to back up such claims.

If the injury is one which may set up sympathetic inflammation in the other eye, this possibility must be allowed for. In these days of antisepsis and asepsis such an occurrence is a great rarity, especially in adults. Recently, however, I saw a woman in whom the interval between the injury and the inflammation in the second eye was fourteen years.

The reason why so many one-eyed workers come into Court is due to the English law not allowing any compensation for the loss of an eye *per se*, as the German law does. The German Imperial Insurance Office has fixed the indemnity for the loss of an eye at 25 per cent. for ordinary workmen and at 30 to 35 per cent. for men requiring accurate binocular vision, or who are exposed to dangers to avoid which good sight is necessary.

The loss of an eye is undoubtedly a very grave injury, and one-eyed men often have to change to a post not so well paid; are discharged as unfit for their former work, or because of a greater risk of another injury; are afraid of an injury to the good eye—though such is astonishingly rare; are less likely to gain any employment, especially if it is obviously an artificial eye that is worn, or the injured eye is unsightly; are less fit to compete in the labour market; complain that their eye quickly tires; complain that they cannot wear an artificial eye for long, and that discharge from the socket may get into the other eye.

Nearly all one-eyed men suffer from sinistrosis, but few are unable to return to their former employment after some months, if willing to do so.

The problem where only the central vision of one eye is lost.

(a) This defect may be due to a traumatic opacity of the cornea or other media, dilation of the pupil, rupture of the choroid, retinal hæmorrhage, etc. Binocular vision, and therefore the perception of depth, may remain when the vision of one eye is only 1/10, when the refraction of the two eyes is the same and their position normal. Worth says that many convergent squinting eyes with a false macula and with vision of only 1/10 can pass Hering's drop test. Owing to this fact the loss of working power is much less than might have been thought, provided the workman does not also suffer from irregular astigmatism or from dazzling. Besides, the conditions under which a man must work are often not so good as those under which we test him. Many of these cases, therefore, do suffer some loss of working power, especially in trades requiring good vision, in some of which as much as 3/4 of the full standard may be required, whereas in a labourer doing only coarse work vision of only 1/2 to 1/10 may suffice.

There is, of course, no constant relation between the lowering of vision and the decrease of earning power, *e.g.*, a one-eyed man doing fine work may meet with a slight injury to his working eye which may produce a total incapacity.

In all cases that come for examination I assume that the refraction of each eye has been carefully noted.

(b) When the lens has been removed, it is a more serious matter, for even when the vision can be materially improved with a convex lens, the man may say with truth that he cannot use it, and even if he can, stereoscopic vision is either lost or very faulty, and a change of glass may be required for different distances. Such patients often complain of dazzling, due to indistinctness of the images, especially if the pupil be altered in form or position, and consequently they sometimes cover the aphakic eye with a patch. These men are therefore practically useless at work which demands good binocular sight.

The problem where both eyes have impaired vision and other complications.

These cases are very numerous and difficult to classify. We must take into account:—

1. The refraction of each eye. Even where glasses materially improve the vision, the patient may declare he cannot wear glasses at work.
2. The presence or absence of squint. An amblyopic eye often squints and there is generally H. or H. astigmatism in both eyes in such cases.
3. Any dazzling, obscuration from opacities, irritation, or asthenopia.
4. The nature of the work and the conditions under which it must be done as to light, dust, heat, etc.

An injured eye may long remain weak and irritable, stopping all work for a man who labours in the open air, in heat, wind, dust, or sunshine, and by an open fire. Burns and inflammation set up by tar or pitch take long to recover. Cicatricial contractions, entropion, and inflammation of the lacrymal sac are awkward complications. Wounds of the ciliary region remain long painful. Dazzling, permanent alteration of the pupil and muscle paresis may prolong disability. Central scotomata cause disability, although isolated contractions of the visual field rarely come into account and the concentric contractions of the neuroses never of themselves interfere with orientation or working power. Loss of accommodation in one eye, especially if there is anisometropia, often interferes with binocular vision. Diplopia and squint often lessen working power.

In many of these cases the workman is temporarily or permanently disabled from following his former occupation, and yet may be able to do some other work. The question is often asked what work is suitable for such patients? It is obvious that no general answer can be given to such a question. Each case must be considered separately.

Fractures and other injuries of the skull without eye lesions, may, of course, cause blindness, total perhaps of one eye or partial of both, either by damaging the cortex of the brain or the optic nerve itself. In these cases, however, the grosser injuries usually overshadow the eye mischief.

Injury and the Infections.

It is possible that an injury may be the means of introducing into an eye the infection of such diseases as tuberculosis, syphilis, anthrax, tetanus, or trachoma. I have met with no instances.

Injury and Tumours.

The connection between an injury and the subsequent growth of a tumour may be raised. In such cases the German Imperial Insurance demands that there should be given : (1) proof of the accident ; (2) evidence that the growth developed on the spot hurt ; and (3) further evidence that symptoms persisted between the time of the accident and the development of the growth.

These demands should be met and will probably rule out of court all cases of intra-ocular malignant glioma as due to injury, but an epibulbar sarcoma or one of the bone or soft tissues of the orbit and possibly even an epithelioma might fulfil these conditions. In these cases experience has taught me that the opinion of an expert pathologist should support that of the surgeon if the growth has been removed, because the examiner has then often little or no chance of forming an opinion as to whether the growth was malignant or not. Some of you may say in this connection—"Never believe the pathologists"—and I confess that I am sometimes inclined to take that advice.

The connection between injury and sarcoma is recognised in other parts of the body ; and many women ascribe cancer of the breast to a blow, although surgeons are doubtful on this point.

Hospitals and the Workmen's Compensation Act.

In conclusion, I would like to state my confirmed opinion that no certificate of ability or inability to work for the purposes of the Act should be given at an eye hospital either to the workman or the employer by any of the staff as such. The hospital should be kept out of all these disputes. If more is required than the ordinary certificate, stating that the workman is a patient of the hospital and not able to work, the application should be referred to the surgeon under whose care the patient is, and he, if requested to do so by the patient or the Insurance Company, should furnish a full report in his private capacity as a surgeon and not as an official of the hospital. Under no circumstances should a hospital be allowed to become a nursery for fraudulent claims, nor should the knowledge gained there be used against a workman. If a house surgeon be permitted to give reports, he will occasionally be absent from duty at the hospital, perhaps for a whole day or longer, when giving evidence in the County Court ; and not infrequently he will be found giving evidence on the side opposite to that of his chief.

DISCUSSION ON THE WORKMEN'S COMPENSATION ACT (1906.)*

BY

ANGUS MACNAB, F.R.C.S.
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THE Workman's Compensation Act (1906), superseded two previous Acts of a similar nature : the Acts of 1897 and 1900. The significance of the Act is contained in the first section which states :

If in any employment personal injury by accident arising out of and in the course of the employment is caused to a workman, his employer shall, subject as hereinafter mentioned, be liable to pay compensation in accordance with the first schedule to the Act.

The remainder of the Act consists of certain restrictions to the universal application of this first section ; of detailed directions as to the assessment of compensation ; and the procedure of the Courts.

The subtleties of the former Acts are swept away by the first four words of this Act : "*If in any employment*," and the obvious intention of the legislature to throw the financial loss of an accident on the employer, is unmistakably effected.

A claim can no longer rest on the dubious problem " Is a ladder a scaffold ? " or the apparently immaterial point : " Was the building on which the workman was employed over 30 feet in height ? "

The simplicity of the language does not appear to have been at once grasped by the Courts, and the expression "*personal injury by accident*" was the battle ground of many strenuous legal encounters. The Court of Appeal held at one stage that the word " accident " indicated something fortuitous and unexpected, and that the Act therefore did not apply if the injury occurred in the ordinary course of work performed in the ordinary way. On an appeal to the House of Lords, it was finally decided that the word " accident " was used in the " popular and ordinary sense of the word, as denoting an unlooked-for mishap " or an untoward event which is not expected or designed " (Lord Macnaughten). Lord MacLaren was not so fortunate in a further attempt to make the meaning even more clear, in a judgment he stated that " if a workman in the reasonable performance of his duties sustains a physiological injury as the result of the work he is engaged in . . . that is accidental injury in the sense of the statute." One trusts that some unfortunate workman will not be deprived of his compensation should in the future a Court decide that his injury was not physiological but pathological.

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* A communication to the Oxford Ophthalmological Congress, July 10th, 1914.

The accepted view of the law will be made clear by several instances of "*personal injury by accident.*" Death under an anæsthetic administered for the performance of an operation; over-exertion causing hernia, cerebral hæmorrhage, or rupture of a previously-diseased aorta; cerebral hæmorrhage caused by excessive drinking of water while firing in a stokehole; nervous shock due to witnessing an accident to a fellow-workman.

The subtlety of the term "*by accident*" is shown in two cases, in each of which a miner contracted pneumonia after a chill; in the first case, the chill was due to the man having to stand in icy water owing to the breakdown of a pump, and it was held to be "*by accident,*" but where an over-heated miner was detained at the foot of the shaft for 1½ hours owing to the breakdown of the cage, and there was exposed to the normal down-draught, the subsequent pneumonia was held not to be a personal injury by accident.

The contraction of a disease is a "*personal injury by accident.*" Lord Halsbury says "it does not appear that by calling the results of an accidental injury a disease, one alters the consequential results of the injury that has been inflicted." It is necessary for the workman to indicate the particular accidental occurrence which determined the onset of the disease before he can succeed, so that such conditions as glass-blower's cataract, or miner's nystagmus would be excluded from Sect. 1. Sect. 8 of the Act—Application of the Act to Industrial Diseases—meets this difficulty. The Third Schedule of the Act contains a list of employments, and opposite to each the associated industrial disease appertaining to that employment. Sect. 8, and the Schedule taken together, make the Act applicable to the common industrial diseases in two of which—glass-workers' cataract and miners' nystagmus—we are especially interested.

Medical interest in the Act is more concerned with the schedules. The first schedule commences with the words: "*The amount of compensation under this Act shall be* . . . . " thus indicating the scope of the schedule, and Section (3) defines the amount. " . . . . . *and in the case of partial* "*incapacity, the weekly payment shall in no case exceed the difference between the* "*amount of the average weekly earnings of the workman before the accident, and* "*the average weekly amount which he is earning or is able to earn in some* "*suitable employment or business after the accident, but shall bear such relation* "*to that difference as under the circumstances of the case may appear proper.*"

Of the medical problems arising out of the Act, the most interesting to the ophthalmic surgeon are those connected with the determination of the compensation to be awarded for partial permanent disablement; or in the case of temporary disablement, in certifying workmen as fit for light or for full work, when the temporary effects of the accident have passed off. A great many claims arise in connection with the loss of an eye, and I propose to direct your attention to the question of the compensation of a workman who has suffered this accident.

Before doing so a few words as to the procedure in a case of accident will be useful to those who are unfamiliar with the working of the Act. The injured workman makes his claim on the employer, and will be paid half of his wage up to the maximum of £1 per week during total incapacity. He will be examined from time to time by a doctor, who will eventually certify him as fit for light or full work. When the man is certified for light work, he is usually provided with some suitable duty, being compensated for the reduced wage by a payment of such portion of the difference as may appear proper, generally half the reduction is made up. If he refuses to accept this position, the employer can stop all compensation, and the man must then bring his case before the County Court and satisfy the judge that he is unfit for work. The sympathy of the Court is with the man who has returned and made a genuine attempt to work; such an action on his part does not prejudice his claim if he should find himself unfit to continue.

A rivetter who was earning £4 per week lost an eye; after two months on full compensation at £1 per week, he was certified for light work and was put on at "bumping up," *i.e.*, holding a heavy hammer against the opposite end of the rivet, he thus earned £2 10s. per week, 15s., being half the loss of wages, was paid him as compensation, making in all £3 5s. per week. After four weeks, he was put on again as a rivetter at full wages, although for some time his slower rate of work was compensated for by his being put on as a time worker instead of the more usual piece work.

Section 2(c).—If a workman has suffered a serious and permanent disablement his rights of compensation pass to his dependents, and actions of his which would have prejudiced his own claim do not prejudice the claims of his dependents, the crux of the position being that the injury results in "*serious and permanent disablement.*" It has been held that the loss of an eye does not lead to serious and permanent disablement in the meaning of the Statute. I have had the opportunity of tracing the careers of many workmen who have lost an eye, the vision of the other being normal, and have never yet found any of them to be earning any less wage than they previously did with two eyes. Even in employments where very considerable mechanical skill and dexterity is required the full wage is obtained, and, so long as the man is able to draw the same wage as his more fortunate two-eyed fellows, it is difficult to see how his wage-earning capacity is reduced.

There are, of course, employments in which the loss of an eye would be an absolute bar to employment. Some of these have been mentioned in the course of the discussion: sailors, engine-drivers, and workers in certain iron trades where there might be risk to their fellow workmen. One can appreciate the point of view of the workman who refuses to hold a "sett" for a one-eyed wielder of a sledge-hammer, and thus the striker loses his employment. The state of the one-eyed mechanic, however, is very far from what many suppose. It must be admitted that in the vast majority of cases the loss of an eye does not produce an appreciable loss of industrial efficiency as measured by the man's pay sheet; and it should be borne in mind that the sole and only claim for compensation under this Act is on account of loss of wages. There is no sympathetic dole for pain and discomfort. The one and only test is wage-earning capacity. Such considerations as the difficulty in finding work on account of disfigurement, or prejudice on the part of the employer against the one-eyed man, are all considered, as they reflect on the wage earned.

The risk of damage to the other eye is one which is often brought forward by counsel in pressing for increased awards; but the work offered as suitable must not be rejected merely because there is some risk attached to it. Fletcher Moulton, L.J., says "You cannot consider an employment suitable that a reasonably careful man desirous of earning his living is entitled to reject because it exposes him to risks so serious in their consequences that he feels that he is not doing his duty to himself and his family in encountering them."

The records of a large Insurance Corporation dealing chiefly with iron workers shows that in 15 years they have had only three claims on account of the second eye being involved in another accident. This company makes no claim for extra premium for one-eyed men, nor do they object to their employment, the additional risk being considered as insufficient to justify a separate classification.

Sometimes a workman who has lost an eye will exaggerate his difficulties when he returns to work ; he is always suffering from slight accidents, barking his knuckles and bruising his fingers ; in my experience, these cases occur more commonly in men who have been away from work for an unnecessarily long time, and result in the man being discharged with a lump sum, when the accidents cease entirely.

The case of the workman whose remaining eye is normal is comparatively simple. The difficult cases are those where the remaining eye is defective to such an extent that the skilled workman must be permanently placed in a lower industrial grade. For the same optical defect the loss of wage-earning capacity will differ greatly according to the nature of the trade in which the workman is employed. In some trades his knowledge of the work will make him such an efficient assistant that the loss of wage will be comparatively slight, in others the man must be either a fully competent mechanic or revert to the grade of a labourer, there being no intermediate position which he can fill.

In all cases the actual ascertained or presumptive loss of wages is assessed, and the maximum amount which the workman will obtain is the purchase price of an annuity amounting to 75 per cent. of what his weekly compensation would be ; in this the Court will be guided by the circumstances of the case, but generally the compensation is half the loss of wages. In the case of a man aged 35 whose loss of wages amounted to £1 per week, the lump sum payable would be £300. In most cases the Insurance Companies prefer to continue the weekly allowance unless they can make a favourable compromise with the man. The payment of a lump sum in most cases seems to have a wonderful effect in increasing the injured workman's efficiency as a wage earner.

It is not incumbent on the employer to find work for the man, although he may show that the man is capable of any ordinary labour, or of some special work at which he can earn a certain definite rate of wage. Generally, in finding work the man gives in his name at the labour exchanges, and can always appear before the County Court judge to show that an honest attempt on his part has failed. A factor of some considerable importance in obstructing a man's endeavours to find work is the action of many Trade Unions in preventing a man from taking less wage than the full rate, or from working at anything but his trade.

In dealing with injured men and examining them from time to time while they are temporarily incapacitated, nothing has been so striking as the moral deterioration due to idleness, and the benefits of an early return to work, even if it be part time or light work. I am concerned with such a case at present : the man is a blacksmith whose earnings would be rather more than £3 per week. He was struck on the eye by a steel splinter in February ; a foreign body was extracted by the magnet ; and he now has a traumatic aphakia, capsular membrane, and a corneal scar, the vision being 6/24. Six weeks after the injury he was most anxious to return to work, in three months the eye was quite quiet and I certified him for light work ; instead of returning to work he revisited the hospital where he had been treated, and the surgeon appears to have suggested that he should not yet return to duty, and spoke of some further operation. Since then the man has avoided further examination, in itself a breach of the very Act from which he derives his only claim to compensation ; he is drawing only £1 per week, whereas at light work this would be at least doubled, and is probably degenerating from a hard-working smith into a public-house loafer. I think I am justified in putting it very strongly that an able-bodied man who has had five months to recover from a traumatic cataract, would be positively benefited by a return to light work.

I cannot urge the point too strongly on those who have to do with injured eyes, that they should encourage the men to return to work as soon as this can be safely done, that if they are in doubt, to advise a return to work, for the man can always cease, and his return is weighty evidence in his favour should the case come into Court I quite agree with the previous speakers that this insurance work should be kept quite apart from hospital practice, and would strongly urge hospital surgeons to make no remarks to patients which they would not be prepared to stand being cross-examined upon in the witness box. Many a workman has evolved a grievance against his employer on account of what he has heard at the hospital. The vast majority of Insurance Companies treat their claims in a generous spirit and instruct their surgeons to give the man the benefit of any reasonable doubt they may feel. The spirit of unrest and insubordination which is aroused by legal proceedings generally is very detrimental to the workman, and that, of course, is not compensated for in his award.

ON THE QUESTION OF COMPENSATION IN INJURIES OF THE EYE.*

BY

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I MAY preface my remarks by speaking of the tendency amongst surgeons to exaggerate the disabilities of the workman who has lost one eye. As compared with his two-eyed comrade it might be said that the one-eyed man was at a disadvantage because of (1) a slight but generally temporary impairment in his working capacity, and (2) a prejudice against one-eyed workmen on behalf of employers and possibly also of insurance companies. With regard to the first point, its existence must be admitted, but such restriction of work is not of long duration, and hardly even necessitates a change of occupation. I cannot call to mind any case in which an honest man had to relinquish his old work in consequence of the loss of binocular vision. I am convinced that many surgeons are apt to be influenced by the patient's opinion of his working capabilities at the time he is seeking a settlement. I will only say that the time to get the workman's true opinion of his working capacity is *after* he has received the lump sum commutation. Surgeons should remember that the joy of the lump sum is apt to give way to acute depression when the workman finds that his insistence on his disability has led to a lower grade of work and wage, and that the compensatory award has been discounted, it may be almost to vanishing point, by loss of wages during the period of litigation, legal fees, and other incidental expenses. In the absence of definite proof to the contrary, it is better to encourage the workman in the belief that he will be able to follow his work practically as well with one eye as he did with two eyes. Granted that he has had a "declaration of liability," it is open to the workman at any time to have his case revised and claim compensation if he can show that his earning capacity has been reduced.

The alleged increased risks of injury in the one-eyed are also liable to be made too much of. It is exceptional to come across cases of injury which can be ascribed purely and solely to the loss of binocular vision. Like a good many other injuries, *e.g.*, injuries from broken spectacle glasses—such misfortunes do occasionally occur, but in actual practice we find they are exceedingly rare—and should not be considered a cause of disability. In the event of such an unlikely accident, the workman would be protected by the "declaration of liability."

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*A contribution to the discussion on Workmen's Compensation at the Oxford Ophthalmological Congress, July 10th, 1914.

As to the prejudice against one-eyed workmen, I do not find that such occurs to any extent in the Midlands, and I do not know of any Insurance Company which makes any objection to the insurance of one-eyed workmen. In any case the prejudice, if it exists, has been largely fostered by the pessimistic attitude and evidence of experts in Court.

As to the *visual acuity* required for the various trades, it is not possible to fix an absolute standard, and no statistics (of any extent) have been collected showing the visual acuity of workmen in different occupations. I have, however, been greatly surprised at the remarkably low standard of visual acuity of many workmen, even in skilled trades. It is exceedingly difficult, and often beyond the capabilities of a surgeon, to give trustworthy evidence as to minimum vision demanded at a given trade. When the surgeon knows nothing whatever about the nature of the work, his evidence on its visual demands can hardly be undervalued.

Malingering has been greatly on the increase during the last few years. I estimate that 16 per cent. of the ophthalmic cases I have reported upon during the last five years, showed evidence of gross malingering. For the preceding five years my estimate was 5 per cent. of malingerers. All varieties, varying from slight exaggeration of symptoms to deliberate self-mutilation, have been met with, but it is only in recent years that the workman has completely grasped the capabilities of old injury or disease of the eye as an instrument for the acquisition of a prolonged rest at the expense of the employer and the possibility of a goodly sum in settlement should the latter's patience become exhausted. These are the cases which give the greatest amount of trouble to the surgeon, and the value of notes, taken before the patient has decided upon claiming compensation, cannot be overestimated. The ideal course to adopt would be to have all workmen's eyes examined when they are applying for a job. Doubtless, the employers would oppose such a suggestion on the score of expense, but it is a question whether it would not be cheaper in the end, as it would put an end to most of the malingering, and thus check the ever-increasing growth of insurance premiums.

CONTRIBUTION TO THE DISCUSSION ON WORKMEN'S COMPENSATION AT THE OXFORD OPHTHALMOLOGICAL CONGRESS, JULY, 10th, 1914.

BY

J. Gray Clegg, M.D., B.S., F.R.C.S., etc.

HON. SURGEON, ROYAL EYE HOSPITAL, MANCHESTER; HON. OPHTHALMIC SURGEON, THE CHILDREN'S HOSPITAL, MANCHESTER; LECTURER IN CLINICAL OPHTHALMOLOGY, THE UNIVERSITY OF MANCHESTER, ETC.

In order to have something of interest to say in the discussion, I have gone through the reports on 136 cases having a medico-legal bearing which have been examined by me during the last 3½ years. I have classified them roughly, as follows:—

Classification.

Miner's nystagmus	13
Conjunctivitis traumatica	2
Nebulæ and leucomata of cornea	27
General cuts of cornea, iris, and lens, with some useful vision	16
Aphakia	9
Dislocation of lens	1
Sympathetic disease	1
Secondary glaucoma	1
Foreign body in globe with good vision	2
Rupture of choroid	1
Rupture of optic nerve	2
Blind eyes from uveitis, etc.	17
Operative anophthalmos	11
Diplopia	2
Rupture of nasal duct	1
Arterio-venous aneurism of orbit	1
Cerebral concussion	1
Anthrax of neck	1
Non-traumatic	27

It will be observed that thirteen raised questions with regard to nystagmus. I am perfectly convinced that it is a common experience for colliers to work with nystagmus, and it is only when the oscillations of the eyeballs produce distressing symptoms that they report themselves unfit, if they are honest men. Advantage is occasionally taken of the presence of nystagmus to have a rest from duties at half pay, and I am informed that it is not unknown for a man suffering from the disease to apply for compensation, and, after a time, to arrange with the colliery company to accept a lump sum instead of weekly payments, and then migrate to some other colliery district, start work, and probably play the same trick again.

It is not always easy to give a decided opinion as to the ability of affected miners to work below ground when nystagmus is not present ordinarily, or when it is only, with difficulty, called out by the tests made in one's consulting room. If the sign is present, or can be elicited, I recommend work above ground for, at least, three months, at the end of which period a re-examination should be made.

I consider, that if no signs can be found after an interval of twelve months, it is certainly not unwise to advise return to work below ground, preferably beginning with those duties which do not induce the condition so frequently as the actual coal-getting.

The apparent increase in the number of persons suffering from nystagmus is a matter of serious concern to mine owners and insurance companies, but I believe the most hopeful line of advance lies in the better illumination of the mines.

Turning now to the traumatic cases. I do not propose to go into any detailed description of the actual conditions themselves, as they do not differ from the common wounds of the eye and its adnexa met with apart from the question of compensation, but I will refer to two.

1. *Arterio-venous aneurism of the orbit.*—This occurred in a man who fell thirty feet. The left globe was displaced downwards, forwards, and outwards; between it and the upper and inner angle of the orbit there was a large pulsating aneurism. The optic nerve head was inflamed. A ligature of the left carotid was performed but without benefit until after an interval of about twelve months, when the pulsation ceased and the swelling almost entirely disappeared, but the optic nerve remained atrophic.

2. *Atropin Eczema.*—Atropin was used for a small ulcer of the right eye, and as a result a violent eczema of the face broke out and led to an extensive leucoma of each cornea.

More especially do I desire to call your attention to the large proportion of cases in which a claim has been made where—at any rate in my opinion—the accident alleged, or otherwise, had nothing whatever to do with the defective condition of the organ.

Eliminating the nystagmus cases, there were 123, of alleged damage from accident, and out of these I reported 27 to be non-traumatic. The conditions were as follows :—

Conjunctivitis	1	Glaucoma	2
Trichiasis	1	Choroiditis	2
Ulcer of cornea	1	Amblyopia ex anopsia	2
Keratitis diffusa	1	Myopia	2
Keratitis	1	Hypermetropia	1
Kerato-iritis	1	Sarcoma of choroid	1
Iridocyclitis	3	Tobacco amblyopia	2
Cataract	6		

One is not justified in concluding that all workmen who make a claim for compensation for defective sight—the result of disease—are dishonest, for undoubtedly, in many cases an insignificant accident calls the attention of the workman to a defect which has long been present, but of which he has been unaware. Only last week I examined a man who had, on two separate occasions, been struck in the right eye by a small chip of metal, and shortly after the second accident, it was discovered that he had a cataract in that eye, which has since been operated on. There is no scar to prove a perforation of the right globe, but there is an ordinary incipient senile cataract in the left eye. In spite of my assurances, the man, however, is still of the opinion that he is entitled to compensation for the time he was off work in hospital.

Sometimes the workman persists in his claim, and forces his case into the Courts, and it would appear to me to be very necessary that from time to time, persons who have made exaggerated claims, and have been shown to be guilty of obtaining money from the insurance companies by lying and malingering, should be made examples of. I remember one case particularly where a potman sustained, during the course of his employment, a cut of the cornea, which was followed by the development of a traumatic cataract. After some months, the lens substance became entirely absorbed. During the whole of the period the man insisted that he had no perception of light in that eye. After a time he alleged that the sight of the uninjured eye was failing, and it appeared to be so much reduced that he had to be led weekly by his mother to the offices of the firm to receive compensation money. She took off his hat, sat him in the chair, took up the pen, put it between his fingers, and guided his hand to the paper for his signature. He was then led away, as if he were an almost completely blind man. Owing in part to the medical report, suspicions were aroused, and this particular man was watched, and it was found that after receiving his compensation, he was in the habit of adjourning to a public house and filling up his time with playing twenty-five break billiards. No action was taken to punish this fellow, and the judge even allowed a declaration of liability against the company to remain on the books, although compensation itself was immediately stopped. In my list there is the name of another man who insisted—in the witness box—that he was so blind in the uninjured eye that he was quite unable to work. In my opinion, there was absolutely no reason for this alleged defect. His own lawyer admitted, privately, that the man was a fraud. The learned judge merely reduced the compensation by a shilling or two per week. In another case a workman claimed damages for loss of vision in both eyes due to marked iridocyclitis, said to be the result of a splash of whisky in them. The disease was, indeed, very severe. To prove the fact of the accident he brought witnesses who were not actually engaged by the firm until one month after the date the accident took place. It would therefore appear that in the English Courts a workman claiming compensation can make the most exaggerated claim, can practise the most glaring malingering, be proved an arrant liar, and yet need fear no punishment if his case is proved to be a bogus one. Such a state of affairs undoubtedly encourages the workman to bid high, for if the feelings of the Judge can be worked upon, the man obtains illicit gains, and if he is proved to be guilty of glaring falsehoods, he is no worse off than before he ventured to make them.

When dealing with reports, I think that there is considerable difficulty in conveying to the lay mind of the legal profession the actual degree of loss of utility in a damaged eye. In endeavouring to explain matters one usually uses such expressions as, the visual acuity is reduced to 1/2, or 1/5, and yet in many occupations the absolute utility of an eye possessing, say, vision of 6/12. J. 1., is as great as if it were 6/6.

I think that it would be better if the medical examiner were able to express his opinion of the usefulness of an organ in percentages of its utility, rather than central visual acuity. An article appeared in the "Ophthalmic Review" giving tables some few years ago, but the figures were calculated for general efficiency, not for special occupations.

Another small point worthy of consideration is the degree of utility of one aphakic eye, supposing the uninjured eye to have normal acuity. It is very rarely possible for any patient to be able to wear comfortably, say, + 10D., on an operated eye with a plane glass, or a weak correcting lens of any kind on the other. I am in the habit of stating in my reports that the acuteness of the vision in the aphakic eye cannot be utilized, and that although the sight with the strong + glass on is good, for practical purposes the eye only serves to enable the workman to avoid large objects on the same side. It follows, therefore, that a workman with one aphakic eye is equally efficient whether the sight of the aphakic eye with the correcting lens is 6/6, or 6/60.

Again, with regard to workmen who have entirely lost the sight of one eye, and where the eye has been removed, the question arises as to how far the loss of binocular vision can be compensated for by practice and experience. Undoubtedly, after the lapse of some weeks or months, a certain amount of adaptation is acquired, but on scientific grounds the difficulties of monocular vision can never be overcome: but this is theoretical. In order to give practical proof, I have recently discussed the matter with a very able medical man who, unfortunately, lost one eye some twenty years ago. He informed me that his appreciation of distances is not perfectly accurate, and the only advantage he has found is in looking at pictures and photographs, for with monocular vision there is a better appreciation of depth, owing to the fact that binocular vision informs one, instantaneously, that the picture itself is flat. Of course, the conditions are different in the case of a workman who is constantly having to make judgment of distance, so that it depends upon the type of work done as to whether the loss of binocular vision is an important point. Each case will therefore have to be considered on its own particular merits.

As far as I know, squinters, who, of course, are in exactly the same condition as regards binocular vision, do not usually make any complaint. In the case of a workman who has lost a squinting eye, the only loss that he experiences is restriction of the field to the side of the lost eye. It is well, therefore, to go carefully into the history.

The question as to the extent of the fields has to be taken into account: some workmen have learned something on this point and then contraction of the field is sure to be found.

I should also be glad to hear what members of the Congress consider is the correct, fair, and just practice with regard to the giving of reports to Insurance Companies on one's own private or hospital patients. I see no difference between the two classes. Personally, I have always felt perfectly free to do so, providing that I have the full and open consent of the patient. I do not regard myself as being called on one side or the other in these cases, but I endeavour to place myself in the position of a judge, weighing all the evidence for and against; the evidence being that of the history, and of the actual condition of the eyes in question.

I have been told that it is impossible to rid oneself of bias in favour of the side to which the report is going, but every endeavour should be made not to allow one's mind to be influenced in any way. If one can maintain such an impartial attitude, it would seem to me that it would not matter which side called one, for the evidence would be the same, namely, the truth, the whole truth, and nothing but the truth. I put this point because the other day in court I was attacked by a man's solicitor, and the attack had such weight that the Judge repeatedly told me that he did not know the practice in medicine, but he did that in law, and that he considered that I had no right to accept what he called a "retainer" from an Insurance Company without the previous consent of the patient. It seemed to be no use my explaining to him that I had discussed the matter fully with the patient before making the examination, and that I had obtained his consent at the time, and that no retainer was in question, because no fee is paid until after the report is made. The man's solicitor made it clear that had I not "sold" myself to the Insurance Company—as he would have liked to put it—he would have called me on his side.

With regard to traumatic neurasthenia, the judges seem to be taking up a rather more sensible view and now somewhat discount the indefinite symptoms from which a workman suffers during the time his case is under consideration.

The contracted field found in this condition does not seem to incommode the patients in getting about. Any method is allowable to catch the workman during the examination. It would appear that sometimes it is well to employ some trick to catch the workman in Court, but the only justification of adopting such a practice is its success, as in the case of a man who had anthrax of the left side of his neck, and who stated that he was quite unable to turn his head to the right. During the hearing he was asked by the barrister to name a man who was sitting behind him. He immediately turned his head and body with the greatest ease.

It appears to be good law to hold an employer liable for even the most far-reaching possible effects of an accident, and now and again the judgment of the Court seems to bear unfairly on the responsible party, as in the case of a man who having sustained a small wound of one cornea that caused a small purulent ulcer which healed perfectly, leaving but a partial leucoma, subsequently died of softening of the brain. The widow brought an action to recover damages for the loss of her husband, and succeeded, the reasoning being that the man worried about the damage to the eye to such an extent that softening of the brain resulted.

ON WORKMEN'S COMPENSATION.*

BY

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SHEFFIELD, ENGLAND.

THE amount of work that arises out of the Workmen's Compensation Act is perhaps most conspicuous in an area where coal mining and steel-making are the principal industries of a large community.

The cases are before one almost daily: every accident that attends one's out-patient department, however trivial, is a possible case for dispute under this Act. In almost any case of illness there may be a claim that it arises out of, and in the course of, the patient's employment. The result of this is to add to the work of diagnosis and treating the patients for their injuries and ailments, the necessity of making a detailed examination of both eyes in case of a dispute arising later—this increases the amount of work considerably, but enables one to discover would-be malingerers at the beginning, when detection is easy, whereby the insurance companies benefit, although I do not know that they make any recompense to the medical profession.

Of the various industries, coal-mining provides the largest number of cases, and the most severe injuries. Hypopyon-ulcers occur much more frequently among coal-miners than among other workers, including steel-workers; and in Sheffield and district many more eyes are lost from hypopyon-ulcers, in coal-miners, than are lost from injuries by steel.

Perhaps the most difficult thing we have to decide is as to whether a man is fit to undertake any particular work. The mere fact that a particular class of work is being performed by men with a similar deformity does not necessarily mean that the man you are reporting on is able to do it; *e.g.*, many coal-miners are working at the coal face to-day with only one eye, and earning as good wages as if they had two. Coal miners who lose one eye, not at work, often return to work, yet if, as I have done, you advise a man who has lost one eye, to return to work, and he soon loses the other, you will immediately wonder if you were wise, and whether you would have returned to the work if you had been in his place.

This is even more complicated in the case of the more highly-skilled trades, such as the iron and steel work, which is divided off into different classes, with different Trade Unions, which will not allow a man who has been apprenticed to one class of work to undertake work in any department to which he was not apprenticed. Here, severe injury to, or loss of, one eye, may incapacitate a man for such work as swinging a sledge-hammer; not, necessarily, because he cannot use it, but because no other workman will hold the "set" for him to strike on. These men can do the ordinary short quick-stroke smithing work, but are not allowed to change to work which they could do.

Loss of binocular vision is made much of. I very much doubt if it is as real a grievance as is commonly supposed. I have tried walking with one eye closed, and find that by moving my head slightly, I get a parallax movement of persons and objects, which gives me an excelleut idea of their relative distance and solidity. By this means, the one-eyed soon learn to get about: *e.g.*, one cricketer from whom I removed an eye, bowled and batted as well as ever a year later, and had a little difficulty only in judging the flight of the ball in fielding Another man with 1/60 vision in his only eye could "tang" table knives fairly well, while a man with a large double leucoma, extensive anterior synchiæ in both eyes, and cataract in one, has been earning his living as a coal-miner for a long time; an iridotomy in one eye provided his only pupil, he had visions of fingers only, or bare 1/60. A man in a shipyard, aged about 60 years, with one eye covered, ran up and down ladders and scaffolds. Another labourer was able to work with about 3/60 in his one eye. On the other hand, in dangerous places, or where a man's timidity may endanger others, as in dealing with molten metal, a man who has lost his confidence as the result of an accident to his eyes, although he has good sight, may be wisely paid to keep away from that kind of work, so also with those on whose sight and judgment the lives of many others may depend, such as officers of the mercantile marine, railway engine drivers, etc.

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* A Contribution to the discussion on Workmen's Compensation at the Oxford Ophthalmological Congress, July 10th, 1914.

Who is the best judge of the fitness or unfitness of a given workman to perform any given work. In my opinion, a medical man is the fittest judge.

But what is the effect of the Act on the workman?

1. Some men are afraid to return to work as early as they otherwise might for fear of losing the half-wages they have, and then not being able to continue to earn their wages. They worry over this, and become neurasthenics. They also lose half their wages.

2. Some unscrupulous men deliberately exaggerate the extent of their disabilities in order to be idle, particularly when money is coming in from other sources, so that the loss of half their wages does not cause them much inconvenience. These bring discredit on the decent honest men.

3. Older men find it more difficult to get work, as they are more liable to accident.

The effect on the Trades Unions and Friendly Societies—Their funds are depleted by men who stay away from work for longer periods than they used to, rightly or wrongly: many went back too soon before the Act became law, now some go back too late.

The employer has to pay for it. He insures his risk and places the cost of insurance on the price of his goods, so that the consumer pays for it; except that if, for this reason, the price become too high, the employer may lose the whole or part of his foreign trade owing to competition.

The County Courts.—These are congested with arbitration work on these cases.

What improvements on existing arrangements can be suggested? We see often now a case fought in the County Courts, with solicitor and barrister on each side, and also a medical expert and perhaps two general practitioners apiece, at a very considerable cost, to settle a matter which amounts to £10 at most. It would be far wiser to send more of these cases to the existing Medical Referees for eye-cases, to decide as to the state of the eye, and, after full examination, to report as to the fitness for work, and the possibility and probability of the condition being due to the alleged accident. The arbitrator, or judge, could then decide as to whether there was legal evidence as to the accident having happened out of, and in the course of, his employment. I was present once in court, when an obvious case of locomotor ataxy was passed off as nystagmus, due to a blow.

Some of the most interesting cases I have come across are.—(1) A boy claimed that myopia was due to a corneal injury by a piece of rust. The corneal scar was the size of a pin's point, and so faint as to be barely visible. He stated that he did not put his head nearer to his work after the accident than before. The case was decided against him.

(2) In two cases, loss of sight was claimed to be due to electric flashes. The first smoked more than 4 ozs. of tobacco a week; his second eye failed some weeks later than the first. It was held to be a case of tobacco amblyopia.

The second had keratitis punctata and a cataract in one eye only; he had been laid up with rheumatism just before his accident. His conjunctiva had been chemosed. I proved that he was wilfully making false statements about loss of sight in his sound eye, and he lost his case.

THE TREATMENT OF THE EARLIER STAGES OF SENILE CATARACT.*

BY

LT.-COL. HENRY SMITH, I.M.S.

HON. SURGEON TO THE VICEROY OF INDIA; CIVIL SURGEON, AMRITSAR, PANJAB.

THE earlier stages of cataract we may divide roughly into two: 1. the stage we can treat without operation; and 2. the stage in which operation is necessary.

1. *The stage we can treat without operation.*—The diagnosis of the earliest stage of cataract does not appear to have received the amount of attention which it deserves, if we are to measure such attention by what has been written on the subject; partly, I suppose, because the ordinary patient pays little or no heed to deteriorating distant vision, so long as his vision is efficient for near objects. Perhaps a larger proportion of this class of case comes to us earlier in the Panjab than to you in Europe, cataract being so prevalent and appearing in the prime of life, so most of my patients are quite aware of the possibility of the onset of cataract, and fear it.

I have been devoting a good deal of attention to this subject for the past few years. Among other patients, I have a large section of railway whose officials I have to examine once a year for vision. When their vision falls below 6/6 they are no longer fit for duty; such patients of necessity remain under my observation. The first symptom the patient complains of, especially railway officials and sportsmen, is that their distant vision is failing, no complaint being made of their near vision. A man's vision will be reduced to 6/15, or even 6/18, before he complains severely of near vision. At 6/12 or better he seldom complains of vision for near purposes. (I am assuming throughout that his vision was formerly normal.) This is the characteristic symptom of the earliest stage of cataract—a symptom which should cause the general practitioner to send the patient to a specialist.

For our present purpose, let us carefully exclude cases with any fundus or vitreous trouble or any retro-bulbar condition. The vision not having fallen below 6/10, we seldom observe any opacities in the lens. At 6/12 we may find sand-like opacities or striæ, central or peripheral. Above 6/12 we nearly always find these conditions. The cases in which the vision has been reduced to 6/8ths or 6/10ths, without any opacity in the lens, show loss of transparency merely. With an acetylene light, for example, you examine a healthy eye at the same time with one of these, and you observe that while the former is absolutely clear, the fundus of the latter appears as if you were examining it with a poor light. If we could put the difference of the clearness of the fundus of these two eyes in some formula, we could estimate for scientific purposes the degree of the loss of transparency. For the present we have to be content with the test cards for this purpose. In diagnosing these cases for treatment, for statistical purposes, we have to be very careful to exclude all other diseased conditions which would interfere with vision; the treatment which I adopt would influence many conditions of the cornea, of the fundus, and retro-bulbar conditions favourably, although combined with a corresponding stage of cataract, and would thus, consequently, vitiate statistics, sometimes favourably, sometimes unfavourably.

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* Read at the Oxford Ophthalmological Congress, July 10th, 1914.

Given a case which is sound, apart from this stage of cataract, with distant vision reduced to 6/8ths, 6/9ths, or 6/10ths, 25 minims of a 1 in 4,000, 5,000, or 6,000 solution of cyanide of mercury, according to the age of the patient (the younger of the patient, the stronger the solution required to produce the standard reaction), injected subconjunctivally, the patient being under the influence of cocaine locally, and having had a hypodermic of morphia up to half-a-grain an hour previously, will, in my observation, within a month of the injection, bring this patient's vision back to 6/6ths, or even 6/5ths, and at the end of three months, he will be one line better on the test card. The railway officials under my care, having to appear before me once a year, seldom fall below 6/10ths, until they come under treatment. I give them a month's leave, and an injection of cyanide of mercury, and by the end of the month they go back to duty with the full amount of vision required; that is, patients who have fallen to 6/8ths, 6/9ths, or 6/10ths. I have a number of these men under observation for more than a year, and so far the results appear to be permanent. I have an officer in the Indian Army, whom an invaliding Board declared to be unfit for any further service on account of his eyesight. He was blind in one eye, and the other was in the early stage of cataract without opacities. He came to me; I asked the authorities to give him a grace of three months; at the end of this time he appeared before the same Board with vision equal to 6/5ths, and was passed for duty, and is now either first or second in command of his regiment. He was treated about three years ago, so the result may be considered as enduring. I have treated a number of sportsmen and others with similar results. I am sorry that I have not my records with me, as I came home on very short leave, intending to do nothing. Your secretary, however, insisted on my contributing something to your proceedings, and I can thus only give you generalities and odd cases from memory.

Cases with sand-like opacities, if the pupillary area is clear of opacity, respond equally well to subconjunctival injections of cyanide of mercury. I have not so much hope of the permanence of the result in these cases. With vision down to 6/18ths, the pupillary area being fairly clear, great improvement follows, but these cases rapidly relapse. (Throughout I am speaking of the light in the tropics). The number of patients in Europe (where cataract matures so much more slowly than with us) who suffer from the early stage of cataract, and who go to their graves before it has reached what one calls "maturity," must be considerable.

I would like to impress on those who may be disposed to devote attention to this line of treatment that as regards statistics, they should be very careful in the diagnosis that they are selecting cases appropriate and uncomplicated by any fundus or retro-bulbar condition. The dream of both patients and ophthalmologists has been to discover some method of "dispersing," as the patient calls it, cataract, or preventing its development, or both. I think we are on the track; I have little doubt of it myself. But I do not, for a moment, think that cyanide of mercury has any more potent action than other agents which would give a similar amount of reaction.

What is the cause of ordinary senile cataract? Can we argue backwards from the above facts towards a solution? Nutrition by osmosis never appealed to me. Is senile cataract due to starvation through a condition of the nutrient channels corresponding to atheroma of the arteries, or is it due to a bio-chemical poison? Is the nutrient fluid of the lens manufactured by a special mechanism, and if so, is that mechanism some of the gland-like cells of the ciliary region? If so, we could understand these cells assuming a pathological function and recovering therefrom under treatment. After all, this would only be the proximate cause, not the more remote one. The more remote cause of senile cataract in the Panjab seems to be connected with the dietary. The area of prevalence of stone in the bladder covers roughly the same area as cataract; and in all these areas the staple food is wheat, not rice. But on this matter I am not dogmatic; I have got no theory, nor has any theory yet been advanced which will harmonise with the facts.

2. *The early stage of cataract in which operation is necessary.*—By this we mean a condition of the lens in which there are definite opacities sufficient to deprive the patient of useful vision, but in which there are varying degrees of transparent or living lens matter— a condition commonly known as immature cataract. The previous class merges into this one by imperceptible degrees. From the patient's point of view, this class demands urgent consideration on account of the depressing influence that delay involves, and the financial ruin that awaits them at the end of the waiting period. Those in extensive practice in the treatment of cataract, will, I am sure, realize this fact. I have frequently been told by lawyers, for example, with mature cataract, that five years previously they could and would have paid any fee for relief, but that now they are practically paupers. So much for the waiting period.

My long distance patients are almost all of this class, and they come to me because their own surgeon refuses to operate, and tells them that they must wait the maturing of the lens. I think I may take for granted that the capsulotomy operation is not satisfactory for the treatment of these cases, and that the different procedures adopted for hastening the maturing process are not satisfactory. I certainly should not get so many of these cases if other competent men found the direct capsulotomy operation or the maturing procedures satisfactory. The direct capsulotomy operation for these cases is very disappointing, owing to the difficulty, I might say impossibility, of removing the living lens matter from the capsule; its consequent proliferation and the formation of a very dense after-cataract, to which the iris is frequently tied down, and which is very difficult to deal with. The latest ripening procedure, I think, is American. It consists in the deliberate production of a traumatic cataract, and the extraction of it within a few days of its production. This ripening procedure is, in my opinion, the worst of the lot. It implies, among other things, the liberation of lens matter into the aqueous chamber, and as a consequence, certain iritis, and the extraction of the lens under these conditions—the most difficult of all cataracts to deal with, together with the fact that it courts serious complications.

The fact that senile immature cataract can be extracted in the capsule as easily as mature cataract, and with as uniformly good results, is one of the strongest claims in favour of intra-capsular extraction of cataract. The normal senile lens is just as easily dislocated as the mature senile cataractous lens. We come across cases of slowly ripening senile cataract, associated with disease of the choroid, which is probably to a large extent dependent on that disease. This is the type of immature cataract which we find not infrequently very difficult to dislocate. It is a type which I would advise the novice not to tackle with a light heart. We succeed in partially dislocating the lens adjacent to the wound; it refuses to move any further. We need to be ready, without delay, to slip a spatula behind it, and to cause it to slide up the spatula by pressure from outside the cornea, taking care not to nip it between the instruments. To do this neatly is what I consider the last accomplishment of a highly accomplished operator. The normal senile immature cataract is one of the simplest of all cataracts to extract by the intra-capsular method. In favour of intra-capsular extraction we have the almost entire absence of iritis; we have no after-cataract to deal with; and we can operate on cataract at any stage.

It has frequently been laid down both in Europe and in America that the eye of the white man is different from that of his Aryan brother. I have now done many cataracts on pure Europeans, many more in different degrees of dilution of European blood, and I can see no difference. A difference which probably does exist between the European and the Panjabi, is that in the Panjab we get cataract much earlier than you do in Europe or America, and that we probably thus operate on a higher proportion of people with a sound fundus, in which case our average resulting vision would be better. I have a number of men between 40 and 55 years of age in the Indian Army doing full duty, including long-range rifle shooting, wearing cataract spectacles.

Another objection raised to the intra-capsular operation is that we cannot do it without an iridectomy. This is not the case. The operation is as easily done without an iridectomy as with one; I have frequently done it through an opium-pupil without difficulty. The same principle holds as regards an iridectomy in this operation as in the capsulotomy operation.

It has also been objected that we do not obtain the "keyhole" pupil often observed after the capsulotomy operation. This is strictly correct; we get a U-shaped pupil. The explanation of the difference is that our iris is free, whereas the pillars of the coloboma following the capsulotomy operation are tied down to the after-cataract; hence it is keyhole. I have frequently extracted the after-cataract following the capsulotomy operation, in cases with a beautiful keyhole coloboma. It was interesting to see that the keyhole disappeared, and that a U-shaped pupil was the result. If you consider the matter from a mechanical standpoint this reasoning and result will be evident. If you atropinize or homatropinize an eye with this keyhole pupil you will observe why it is keyhole.

I would like to draw your attention to the progress of intra-capsular extraction in India. When I first began the teaching of intra-capsular extraction, there were about 5,000 cataracts done yearly in the Panjab province. In 1912 the number had increased to about 15,000, and in 1913 I understand that it is between 16,000 and 17,000 in the same area These are practically all intra-capsular; at least 90 per cent. of them are. In other provinces where intra-capsular extraction is becoming the operation of election, similar progress is being made. I think I can see the day, not far distant, when intra-capsular extraction will be the operation throughout the Indian Empire, and when 60,000 cataracts a year will be done in that Empire.

I feel that this is a rather disjointed discourse, simply touching on the outskirts of a big subject, but the interest is more in the discussion to follow than in this paper. I shall be delighted to answer any questions or to give any details connected with the subject, as far as I can, and I think it is better to leave more time for discussion than to read a longer paper.

It is my hope that in the near future some generous people, associated with a generous government, will found a post-graduate school of ophthalmology in the Panjab—that area of the world in which diseases of the eye are most prevalent—and that it will be hampered neither by finance nor by spheres of influence; that this school will be manned by clinical and research workers sufficiently to utilize the enormous amount of material available for teaching. The Indian Empire requires such a school for the training of its own staff, and for the doing of research work in ophthalmology—a matter which so vitally concerns the people of our huge Indian Empire. It should not be forgotten that it is the surgeon who has commanded the confidence of the people of India for Western Medicine, and that it is he who still continues to command their confidence, and, that without him, there would be little respect to-day from the people of India for medicine or sanitation.

Single-handed and unofficially I have been doing what I could in the teaching of men, both Indian and European, in addition to my ordinary duties. This, of necessity, is confined to the clinical side, and to a limited number. To cover the whole ground, and to do my official work, would of course be absolutely beyond the physical capacity of one man. A school thus established would be in a position to give as fine a training in pathological work as any in the world; the fields open in research work are unlimited and seductive. In the clinical and operative side we should be able to give the finest course of training in the world on account of the vastness of our material. So, I hope we shall be able to welcome you to our Indian School of Ophthalmology in the not-distant future.

(From the University Eye Clinic in Bucharest, Roumania.)
(Professor Stanculeanu.)

OPTIC ATROPHY IN TABES AND ITS TREATMENT BY NEOSALVARSAN.

BY
J. E. Kingsley, M.D.
BOSTON, U.S.A.

Many ophthalmic surgeons believe that no improvement is to be obtained in optic atrophy by any treatment whatever; others think that by a tonic treatment with strychnine, hot baths, etc., an amelioration is obtained; while still others, following the new discoveries in the treatment of syphilis by arsenic, hold that good results can be obtained in optic atrophy by some such treatment also; but the results achieved by the use of atoxyl, hectine, etc., proved that the remedies had a very opposite effect, as complete blindness often quickly followed their administration, and in all cases were the results worse than by the old method of treatment by mercury.

Now, with the discovery of "606," cases of atrophy of the optic nerve have a brighter outlook, although the results obtained by this treatment are not even yet altogether conclusive.

Having had the opportunity of following some cases of tabetic atrophy in the Bucharest clinic and of watching the results obtained by "914," I may say there are two distinct classes of optic atrophy:—1st, those which respond to the treatment; and 2nd, those which show no improvement whatever.

The treatment at the Bucharest clinic is both local and general.

The local consists of stimulation and toning up of the nerve fibres. The stimulation is produced by galvanization of from 10 to 20 minutes every day with a 5 to 8 ampères current. Subconjunctival injections of sodium chloride, 5 per cent. to 10 per cent., or $Hg.Cy_2$, 1/1,500, can be substituted, if desired. For the tonic treatment, injections of strychnine, 1 to 5 mgr., are given every day for twenty injections, in combination with the above. The patient during this period should be absolved from all work, and the eyes protected by coloured glasses.

The general treatment is specific. Intravenous injections of neosalvarsan are given and at the same time pilocarpine 1 to 3 ctgr. twice a week or aspirin 1 to 2 gr. daily with hot baths and a regular purgative are employed, in order to rid the system of all toxic substances.

The injections of neosalvarsan are made in a series of from 6 to 8, with a period of 6 to 7 days between each injection, beginning with 30 ctgr. for the first injection. The second is increased to 45 ctgr., and for the others, doses of 60 ctgr. are given.

Under this treatment, I have observed two cases where decided improvement was noted. First, there was an amelioration in the evolution of the disease, and then an improvement in the vision. Although an improvement in the acuity of perception is seldom observed in such cases, we very frequently notice an enlargement of the field of vision, and a marked improvement in the perception of colours.

The question arises, how can we distinguish which cases will benefit by treatment, and which will fail to do so? From the observations which have been made at the Bucharest clinic, it would seem possible to discern such cases by taking into account: first, the field of vision; and, secondly, the acuity.

The most favourable cases are those which still have an acuity of vision above 1/10, and where there remains a fairly good perception of colours. If blue only is affected, and the scotoma is narrow and concentric, such cases justify, as a rule, a good prognosis; but if the acuity is below 1/10, and the perception of colour is poor, combined with a sector-shaped scotoma, then the prognosis is bad.

When an improvement does take place, it is usually to be observed after the first four injections, and it has been noted that when no improvement has been obtained then, continued treatment was of no avail.

Professor Stanculeanu and his assistant Dr. Mihail (who makes a speciality of this disease) are of the opinion, judging from the results which they have seen in atrophy when treated by neosalvarsan, that if patients suffering from this disease would present themselves for treatment while it was still in its early stage, very good results might be looked for in most cases.

Cases.

Case I.—G. S., aged forty-eight years. For the past four months her sight has been failing, especially when attempting to read or write, the right eye being the worse. The ocular examination showed inequality of the pupils, the right being somewhat the larger, and complete loss of light reflex, although some accommodation was still present. Discs of greenish-white colour with clear outlines and the retinal vessels small and narrow. R.V.= fingers at 0.10 c.m. L.E.=0.50 c.m. The field of vision of the right eye could not be taken. L.E. total scotoma for all colours, combined with a peripherical concentric scotoma for white, which on the nasal side is close to the fixation point. Wassermann reaction negative.

The treatment for both eyes was subconjunctival injections of $Hg.Cy_2$, 1/1500, ½ c.c., combined with injections of strychnine in the temples and galvanization. Four injections of "914" with 0·45 ctgr. were given and after them the R.V. = 0. L.V. fingers at 50 c.m. The visual field of the left eye shows absolute and total scotoma for all colours, the scotoma for white involves the neighbourhood of the point of fixation, where a relative scotoma is to be found.

Case II.—Tabetic atrophy of both eyes in evolution.—N. G., aged 40 years, suffered from syphilis twelve years go. His sight has been failing for the last six months without presenting any particular symptom. Examination of the eyes showed the persistence of all pupillary reflexes in both eyes. The discs were greenish-white, an appearance more marked in the left eye. R. V. = 1/8. L. V. = 1/40. The field of vision: R.E., total scotoma for green and blue, distinguishes white and red. L.E., absolute total scotoma for all colours and the disappearance of the lower half of the visual field for white. Wassermann negative. After local treatment with subconjunctival injections of sodium chloride, galvanization, injections of strychnine, and four intravenous injections of 0.45 neosalvarsan, the visual field for both eyes remained the same as before. R.V. = 1/6, L.V. = 1/20.

Case III.—N. P., aged 31 years, had syphilis seven years ago. The ocular disease began two years ago by slow but progressive failure of sight. He was subjected to a short mercurial course. On examination, the pupils were found equal but irregular in their outline. The fundus showed white atrophic discs, more marked in the R.E. Wassermann positive. R.V. = 1/30; L.V. = 1/15. The fields of vision, R.E., dichromic vision for all colours, concentric peripheral narrowing for white, more marked in the superior nasal part, its point stretching up to 5° from the point of fixation. L.E.—absolute total dichromic vision for all colours, together with a peripheral concentric scotoma for white, affecting more the superior nasal half of the visual field. Local treatment was applied, consisting of subconjunctival injections of sodium chloride, injections of strychnine in the temples, galvanization, and four intravenous injections with neosalvarsan. R.V. = 1/20; L.V. = 1/15. Both fields of vision still maintain absolute total dichromic vision for all colours. However, a general peripheral enlargement of the visual field for white is noticed, which in the left eye reaches the normal limits. The sector-shaped scotomas have removed their points from the point of fixation, reaching up to 15°.

Case IV.—C. V., aged 32 years. She contracted syphilis when 26 years of age and at the same time became pregnant. Her eyes have troubled her for the last two years, when sight began to fail gradually. She complains of violent headaches, and says her hair comes out. The ocular examination showed irregular pupils in miosis, not reacting to light. Wassermann negative. Greenish-white discs, with thin retinal vessels. R.V. = 1/3. L.V. = 2/3. The visual fields: R.E. absolute total scotoma for green and a concentric peripheral narrowing of the visual field for blue and red, retaining the normal limits for white. L.E. scotoma which affects, for all colours, the whole upper half of the visual field. There is a sector-shaped supero-nasal scotoma for white, whose point does not come up to 5° from the point of fixation. After treatment by a series of neosalvarsan injections, 0.45 ct., and a series of mercurial treatments, together with local tonics, we find seven months later the following result: R.V. = 1/10. L.V. = 1/4. The visual field: R.E. absolute total dichromic vision for all colours, a relative dichromic vision for white which stretches from the normal limits of the visual field up to 30° from the point of fixation. The perception for white is normal, which extends from the point of fixation up to 30° around. L.E. absolute total dichromic vision for blue. A marked narrowing of the visual fields for green for 5° round the point of fixation, and for red 15° round the point of fixation. The supero-nasal scotoma for white still persists.

Case V.—P. T., aged 36 years, had syphilis 7 years ago. He has complained of the right eye for the last two years, when a paralysis of the third nerve set in and his sight began to fail until it disappeared altogether. A year ago his left eye began to fail also. On examination, we found the right pupil in mydriasis. Neither pupil reacts to light. Fundus : greenish-white discs, very thin retinal vessels, R.V. = O., L.V.=1/6. The visual fields : R.E. none ; L.E. a concentric narrowing of the visual fields for all colours. Total and absolute dichromic vision for blue and red. Local and general treatment was applied : four series of neosalvarsan injections, each of four intravenous injections of 0·45 – 0·60 ctr. After eight months treatment, the vision is for the R.E. = O. and L.E. 1/6 (the same as before). The visual fields have increased for all colours, but the dichromic vision still persists for green.

CURRENT LITERATURE.

NOTE.—Communications of which the titles only are given either contain nothing new or else do not lend themselves to abstract.

I.—OPHTHALMOLOGY AND GENERAL MEDICINE.

(*Fourth Notice.*)

(1) **Tyson, H. H., and Clark, L. Pierce.—The eye syndrome of dementia præcox.** *Archives of Ophthalmology*, May, 1912.

(2) **Goulden, Charles.—Optic neuritis and myelitis.** *Ophthalmic Review*, July, 1914, and *Transactions Ophthalmological Society U.K.*, Vol. XXXIV, 1914.

(1) **Tyson and Clark,** have analysed 115 consecutive cases of dementia præcox and have found definite changes and symptoms in all cases which are fully distinctive of this psychosis.

The fundus changes, as seen clinically, may be divided into three groups : 1. (129 eyes). Congestion of discs ; hyperæmia and œdema ; dilated, dark coloured veins ; lightly contracted arteries and blurring of the edges of the discs, all varying in degree. These changes constitute a low grade of neuritis of the optic nerve. 2. (21 eyes). Congestion of the nasal side, with temporal pallor of discs, dilated veins, contracted arteries. 3. (68 eyes). Pallor of discs, dilated veins, and contracted arteries. These changes constitute anæmia and partial atrophy of the optic nerve. One hundred and nine cases were examined with the ophthalmoscope ; 55 were males and 54 females. The ages of the males were from 12 to 47 years, the females from 13 to 39 years. All the different forms of dementia præcox were under study, and the authors find that the more marked changes in the eye syndrome were found in the more rapidly deteriorating types. As a point of differentiation from the eye conditions in cases of tobacco and alcohol toxæmia, there was but one case showing a central scotoma for red, and this case gave a history of tobacco and alcohol excesses. The authors think that some other toxin is responsible for the eye changes in dementia præcox, and they believe this to be a vascular poison, primarily. Its most probable source is in auto-intoxication from the intestines or liver. Possibly, a faulty metabolism from a perverted action of some of the ductless glands (thyroid specially) may be the pathogenic agent.

The discs in a number of cases were repeatedly examined while under the influence of treatment, to eliminate the toxin, and a marked degree of betterment of the congestive margins of the discs was noticed, but the central œdema and transitional pallor continued. The pupils were examined in 85 cases. An average enlargement of 1·9/85 mm. for dementia præcox over the normal was evident. The visual colour fields in the 81 cases examined for this were all found to be concentrically contracted. In the authors' examinations of other types of insanity, imbecility, or idiocy, they have found no other condition similar to that found for dementia præcox. They consider their findings likely to be of use in diagnosis and prognosis. They have since examined additional cases, bringing the total up to 200, and about the same percentage of changes has been found as was observed in the first 115.

ROSA FORD.

(2) There is a rare condition where optic neuritis may precede, accompany, or follow myelitis. To this symptom-complex the name *Neuromyélite optique aiguë* has been applied by Devic (1894), and *Ophtalmoneuromyélite* by de Lapersonne

The case now reported by **Goulden**, of Oldham, makes the fifty-second on record. The main facts follow:

The patient, aged 60 years, complained of gradual failure of vision in both eyes, beginning five days before he consulted the author, and having by then reached such a pitch that he had to be led about. The objective findings included dilated and irresponsive pupils, slight "fluffiness" of the edges of the optic discs, and a central colour scotoma for red. V.=hand movements. The condition was diagnosed as one of retro-ocular neuritis, thought to be due to a particularly severe oral sepsis. After a few teeth had been removed under the influence of nitrous oxide gas, the patient went straight home to bed. A couple of days later, his legs were found to be anæsthetic and paretic. The knee and plantar reflexes could not be elicited. Two days later, the patient was completely paralysed below the waist, and he had lost control over the bladder and rectum. The eye condition remained without obvious change. The anæsthesia rose higher until it reached the level of the fourth intercostal space in front. Finally, the patient died of exhaustion, ten days after he was first seen and sixteen after sight had been first noticed to fail. There was no autopsy.

Discussing this syndrome, Goulden states that it is rare for the neuritis and the myelitis to make their appearance at the same moment. In about four-fifths of the cases the optic neuritis is the first to occur. The two events are usually separated by a period of a few days, but it may be as long as two months. There is a tendency for both conditions to end in recovery, although complete cure is very rare, especially in acute cases, such as the one outlined above.

Either optic neuritis or retro-ocular neuritis may be present. The former may be slight or severe, an apparently trivial change in the optic disc being often accompanied by serious loss of sight. The retinal arteries may appear filiform and the veins full and tortuous. The vessels may be obscured by areas of exudation, and hæmorrhages have been described at the edge of the disc and in the adjacent retina. In one case yellowish dots were scattered about the fundus. Retro-ocular neuritis appears to be less common than optic neuritis. It is, as usual, ushered in by severe frontal headache, and the eyes are generally very painful on pressure. With the ophthalmoscope, little out of the common is to be seen. For example, there may be merely a little "fluffiness" of the edges of the disc, while at other times careful examination has shown nothing abnormal.

There is nothing peculiar about the myelitis which accompanies the optic neuritis. Insidious onset, paralysis and anæsthesia of legs, incontinence of urine and fæces, lost reflexes, and trophic disturbances characterise the myelitis in these as in other cases. As the author points out, there is a likeness in the course pursued by the spinal and the ocular affection. "Both have slight symptoms at the commencement, both pass on to a period of greatest intensity, and again to a period of retrogression ending in many cases in recovery. In the less severe cases of myelitis, the optic neuritis is less severe, and this is to be noted especially in those cases that have been reported in the last ten years."

As regards the morbid anatomy of the affection, slight naked-eye changes only have been found in the brain and cerebral meninges. Trivial congestion, excess of subarachnoid fluid, some swelling of the pia mater, œdema of the meninges, excess of fluid in the ventricles, and small hæmorrhages in the fissure of Sylvius are among the lesions noted by various observers. The meninges of the cord, again, do not usually manifest very marked changes. As to the spinal cord itself, lesions may be diffuse and extensive, or, on the other hand, they may be confined to a particular segment of the cord, as the lumbar enlargement. They include softening and greyish or yellowish discolouration of the diseased parts of the cord. In one case (Dreschfeld) the meninges were converted into a cylinder, as it were, containing a diffluent mass. The optic nerves may show no changes or there may be softened greyish patches, but in any event the changes do not extend beyond the chiasma. The microscopic changes in the optic nerves comprise destruction of the myelin sheath around the medium-sized nerves, leaving but a few peripheral fibres intact, together with an infiltration of the perifascicular septa with many rounded granular cells which surround the blood vessels and which are crowded into the perivascular spaces. The granular contents of these cells stain black with osmic acid.

Several hypotheses have been advanced to explain the connection between the optic neuritis, on the one hand, and myelitis, on the other. The more modern writers, however, seem almost agreed that the lesions are produced by some common agent acting on the spinal cord and the optic nerves. This agent, which is most likely of an infective nature, is believed to act directly upon the nervous structures. In most cases the cervical cord is not affected, so that the associated optic neuritis cannot be accounted for on the vaso-motor hypothesis. It has been suggested that the neuritis results from meningitis ascending from the focus of disease in the cord. This explanation cannot be held to apply to all cases. The main arguments may be marshalled as follows :—(1) The optic nerve is the only nerve involved in the great majority of cases ; (2) in forty out of fifty cases the optic neuritis appeared before the myelitis ; (3) cerebral meningitis is seldom found at the autopsy ; (4) we do not find a continuous meningitis.

The ætiology still remains obscure. Syphilis, however, has been present in more than one case.*

The disease is met with in patients whose ages have ranged from 12 to 60 years, and males are most frequently affected than females. The mortality, which is often due to sepsis from bedsores or from intercurrent disease, amounts to about 50 per cent. Perfect recovery appears to be rare.

SYDNEY STEPHENSON.

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* A. S. Cobbledick, in reporting a syphilitic case in THE OPHTHALMOSCOPE of January, 1910 (a reference to which is not included in the bibliography appended to Goulden's communication), suggested that with modern methods of recognition, syphilis may now be found to play a prominent part in the production of this rare and interesting symptom-complex.

II.—THE EYE DISEASES PREVALENT AT TRIPOLI.

Re, Francesco.—A short note on the ocular diseases prevalent at Tripoli. (Brevi note sulle malattie oculari dominanti a Tripoli.) *Archivio di Ottalmologia*, Anno XX, No. 2, Agosto, 1912.

Re, of Palermo, gives in this paper a good idea of the nature of the work of the ophthalmic department under the Red Cross Hospital in Tripoli.

As can readily be understood, the main subject is trachoma, its frequency, and its consequences. The author describes briefly the accommodation at the disposal of the department. This is in two sections, an outdoor and an indoor, not connected. The out-patient part seems to be somewhat pristine, but sufficient ; and the indoor evidently is quite all that is required.

The number of patients attending daily at the out-patient department is, roughly, four hundred. Plentiful opportunity is thus given for the observation of large numbers of persons, and, as it happens, also a large variety of persons.

In addition, however, to working in hospital, the writer has investigated the scholars in two schools in the city, and the following is the result as regards trachoma :—

School (1)	Females	of 195 pupils	26 were free.
	Males	of 186 ,,	12 ,, ,,
School (2)	Males (only)	of 194 ,,	36 ,, ,,

Roughly, this is a percentage of 85 of pupils in the schools who are trachomatous. The ages (even approximate) are not mentioned. The pupils are not of the worst kind in the city, many being of good class, clean and tidy, and it is mostly these who are free of trachoma.

The writer goes on to say that it is rare to see a native who has not some ocular disease, and also to meet with any individual who sees with both eyes. None the less, there are only three or four blind beggars in the city of Tripoli.

The author gives an interesting little account of the native treatment of eye diseases, which reminds one of that recommended in the Eber's papyrus. Incantations seem to play an important part still, as 1,500 years B.C. The actual cautery is much in evidence for all sorts of trouble apparently, and it is employed in the form of a stick which is rendered incandescent, thus forming a kind of charcoal probably. This is used to produce a puncture burn of the skin of lids or brow, and also to produce cicatrices which are intended to correct the deformity in entropion. It seems that an eyewash of silver nitrate is also used, but as the silver has been invariably precipitated before use, but little benefit follows its employment. Thus, the treatment limits itself moderately completely to incantations and the red-hot stick, whilst results are still more strictly limited.

As regards the complications of trachoma, Re remarks upon the rarity of dacryocystitis associated with the conjunctival conditions. He says that, contrary to the opinion usually held, he has not seen a single case of trachomatous dacryocystitis. Dacryocystitis of any kind is very rare in Tripoli, from which the writer implies that skeletal peculiarities, such as are seen in the variety of nationalities which inhabit the city and province, are not the provoking or predisposing cause of the inflammation.

Of the totals registered in the hospital books (for they kept fairly satisfactory books even during the war), 46 per cent. have trichiasis, 67 per cent. have leucomata of the cornea of some kind, 14 per cent. have adherent leucomata, and, finally, 2 per cent. are blind of one or both eyes. Xerosis of the conjunctiva is frequently seen.

The author remarks briefly on the action of the fly as a "disease carrier" and the carelessness of the Arabs in not disturbing the insect, which seemingly delights to spend its leisure hours amongst the discharge on the lids of the unfortunate patients.

Finally, it is clear that Re considers that some, at least, of the prevalence of eye disease is due to the lazy, dirty habits of the people, and thinks that if improvement is to be brought about, it is by altering these habits, in addition to careful local treatment. LESLIE BUCHANAN.

III.—SCLERAL COLLAPSE DURING EXTRACTION OF CATARACT.

(1) **Cantonnet.—Transitory ophthalmomalacia (scleral collapse) during a cataract operation on a diabetic. (Ophtalmomalacie transitoire (collapsus scléral) au cours d'une opération de cataracte chez un diabétique.)** *Archives d'Ophtalmologie*, février, 1911.

(2) **Boulai, J.—A case of double collapse of the sclerotic.** *La Clinique Ophtalmologique*, 10 février, 1911.

(1) **Cantonnet** records a case of scleral collapse during the performance of a cataract operation on a diabetic man, aged 62 years. After three instillations of 4 per cent. cocaine, and before the operation was begun, the globe appeared diminished in size and atrophic, whilst a faint interstitial clouding of the cornea was observed. The tension was —1. After the incision and iridectomy, the cornea was sunken in the anterior chamber, the iris funnel-like and the globe like a collapsed rubber ball, the corneal wound gaping widely. Extraction was completed rapidly by means of Snellen's loop. During the two following days, the patient was in a condition of coma, but recovered on the third, and was allowed up on the sixth. Beyond a suspicion of iritis, the eye did well, and vision was $\frac{7}{10}$ with + 12 D. sph.

The author has found 35 similar cases recorded, all in recent literature. He notes that among 27 patients 21 were men and 6 women, the average age being 58½ years, younger than might be expected.

As regards causation, Cantonnet considers that the scleral collapse is the result of the retraction of the vitreous and its probable dehydration, but that is only a secondary cause. Local conditions of the eye are doubtless to a certain extent responsible as a primary cause, but some general condition, impossible to define in the present state of our knowledge, is more likely to be to blame. The cases recorded by Santos Fernandez (4), O'Connor (1), and le Roux (*vide* THE OPHTHALMOSCOPE, April, 1911), where the second eye underwent the same change at operation, support the latter theory.

The author prefers to speak of the condition as ophthalmomalacia rather than as scleral collapse. BERNARD CRIDLAND.

(2) **Boulai,** of Rennes, adds another case to the list of this rare complication of the extraction of cataract.* As the author says, what happened was identical with the occurrences in le Roux's case. There was no visible escape of vitreous; the eye simply softened and the cornea collapsed, followed presently by the sclerotic Both eyes did quite well, except that owing to the patient rubbing his first operated eye, there was an attack of iritis in this one.

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* For abstracts see recent numbers of THE OPHTHALMOSCOPE.

Boulai is as much at a loss as others as to the cause of this curious condition. He is not inclined to accept for his case the hypothesis of L. Dor, that a certain amount of vitreous escapes unperceived. He considers, rather, with le Roux, that there is a pathological condition of the eye membranes which has caused the cataract—the patient was only fifty years at the time of operation—or else that arterio-sclerosis, pure and simple, is to be blamed. "La tension sanguine exagérée ayant amené d'une part une altération cristallinienne précoce, et de l'autre une déplétion brusque, trop rapide en tout cas, du contenu du liquide oculaire."

ERNEST THOMSON.

IV.—CONGENITAL ANOMALIES.

(*Second Notice.*)

(1) **Eberhardt, W.—Cryptophthalmia.** *Ophthalmic Record*, January, 1911.

(2) **v. Szily, A.—On the embryological laws which explain congenital malformation of the eye. (Ueber die entwicklungsgeschlicktlichen Grundlagen für die Erklärung der kongenitalen Defektbildungen am Auge.)** *Bericht der Ophthalmologishen Gesellschaft*, Heidelberg, 1912.

(3) **Hüttemann, R.—On ptosis congenita with heredity. (Ueber Ptosis congenita mit Heredität.)** von Græfe's *Archiv f. Ophthalmologie*, Bd. LXXX, Heft ii, November 7, 1911.

(4) **Beauvieux, J. and Delorme, A.—Congenital anomalies of the iris, (Anomalies congénitales de l'iris.)** *L'Ophtalmologie Provinciale*, mars. 1912.

(5) **Ruebel, Eugen.—Congenital family flatness of the cornea. (Kongenitale familiäre Flacheit der Kornea.)** *Klin. Monatsbl. f. Augenheilkunde*, April, 1912.

(6) **Traquair, H. M.—A case of congenital deficiency of cilia and intermarginal area of both lower lids with distichiasis.** *Ophth. Review*, May, 1912.

(7) **Thomson, J. E. G., and Souter, W. C.—Congenital ptosis with associated lid movements of the affected eye.** *Ophth. Review*, June, 1912.

(8) **Hird, B.—Colobomata of the Eye.** *Ophthalmic Review*, 1912, pp. 161, 225, and 321.

(9) **Grilli.—A case of congenital polycoria. (Un caso di policoria congenita.)** *Rivista Italiana di Ottalmologia*, Giugno-Luglio, 1912.

(10) **Hirsch, Camill.—Encanthoschisis and other congenital anomalies of the eye. (Ueber Enkanthoschisis und andere angeborene Anomalien des Auges.)** *Klin. Monatsbl. f. Augenheilkunde*, Juli, 1912.

(11) **Velhagen, C.—Connective tissue formation on the posterior surface of the lens presenting the picture of glioma retinæ. (Bindegewebsbildung an der hinteren Linsenfläche unter dem Bilde des Glioma Retinæ.)** *Klin. Monatsbl. f. Augenheilkunde*, November, 1912.

(12) **Aurand.—Congenital active enophthalmos with simultaneous occlusion of the eyelids, associated with ophthalmoplegia interna. (Enophtalmie active congénitale avec occlusion simultanée des paupières, ophtalmoplégie interne associée.)** *Revue Générale d'Ophtalmologie*, 30 novembre, 1912.

(13) **v. Szily, A.—On the primary cause of ocular malformations. (Ueber die primäre Ursache der Missbildung des Auges.** *Bericht der Ophthalmologischen Gesellschaft*, Heidelberg, 1912.

(14) **Pagenstecher, H. S.—The causal production of ocular malformations and of congenital cataract. (Die causale Genese von Augenmissbildungen und angeborenen Staren.)** *Bericht der Ophthalmologischen Gesellschaft*, Heidelberg, 1912.

(1) **Eberhardt,** of Michigan, Ind., reports the case of a newly-born female child who was perfectly well developed with the exception of a deformed left concha (microtia) and total bilateral symblepharon. The skin extended uninterruptedly over spherical prominences, caused by the underlying eyeballs. Eyebrows were present, but no cilia. A faint depressed line indicated the junction of upper and lower lids on each side. Exploratory operation along these lines showed that the eyes were covered by adherent conjunctiva, but both were of a uniform dark dull appearance, like a "dark blue grape with the bloom still on." There was no trace of a pupil or of a fundus reflex. The separated eyelids gradually grew together again after the plastic operation.

There was a history of consanguinity of the parents, and a younger sister of the patient showed total symblepharon in one eye and complete symblepharon of the upper lid in the other. An elder brother suffered from an obscure nervous disease, chiefly characterised by tremor.

J. JAMESON EVANS.

(2) **v. Szily,** of Freiberg-i.-Br., gave a short account of his researches upon congenital defects in the eye which he intends to publish elsewhere *in extenso.* He bred rabbits from a buck which had a coloboma, and examined their embryos by serial sections and by other means. These serial sections he reconstructed, and exhibited the models to the Heidelburg Congress. It is quite impossible to gather anything material from the short abstract except that the hitherto received theory, that all typical deformities are caused by a mechanical impediment to the closure of the orbital fissure, is incorrect.

Plate I, which is appended to this article, has no connection with v. Szily's paper. It really belongs to a demonstration by the same author on the cellular pathology of the cornea and conjunctiva (page 357).

T. HARRISON BUTLER.

(3) The family tree recorded by **Hütteman,** of Strassburg, extends to three generations: grandfather suffering from ptosis and epicanthus, there had been no similar case in his family before, and it was popularly ascribed to his mother having seen a corpse, the eyes of which were half-closed, during her pregnancy. Both his sons had the same defect. The first son had had seven children, four of whom were alive. Three of the latter and two out of the three dead ones were affected. The second son had three living children, two of whom were affected, and a fourth, now dead, was said to have been similarly deformed. The wives of both fathers were normal, and it must be mentioned that the few children who had escaped showed a very striking likeness to their mothers.

With regard to the pathology of the condition, Hüttemann attaches importance to the results of the electric test.—No reaction to the galvanic current could be elicited by applying the small electrode to the middle of the eyebrow for the levator palpebræ superioris. According to Bregman, the healthy muscle cannot be thus stimulated, while quite weak currents suffice in the peripheral paresis of the oculomotorius to produce marked reaction. This means that in Hütteman's case, the muscle was either normal or absent, and the presence of ptosis makes the latter alternative a certainty.

The photograph of the whole family in a group, which is appended to this communication, is a very interesting feature. R. GRUBER.

(4) **Beauvieux** and **Delorme** report three cases of congenital anomalies of the iris. The cases illustrate the following conditions :—congenital aniridia, polycoria, and heterochromia.

They remind their readers that these anomalies are less often met with than conditions such as coloboma, corectopia, and persistent pupillary membrane.

Aniridia or irideremia may be complete or partial. The condition is rare ; and is found in about 1 in 3,000 ophthalmic cases. A careful search of the literature revealed notes of 136 cases. A complete bibliography on the subject up to 1905 will be found in an article by van Duyse in the "French Encyclopædia of Ophthalmology." Blair and Potter have described a case since then.

The influence of heredity is important. Other ocular malformations are always present, *e.g.*, megalo- or micro-cornea, various forms of lental opacities, luxations of the lens, coloboma of the retina, nystagmus, atrophy of the ciliary processes, lack of pigment in the fundus, persistent hyaloid artery, high myopia, and paralysis of the extrinsic muscles. A frequent complication of the condition is glaucoma ; the authors relate the different theories brought forward to account for the production of the high tension. A brief account is given of the theories that explain the origin of irideremia.

Thirty cases of polycoria were published up to 1907. The authors add three others besides their own. Diplocoria is the commonest condition, and a sphincter is usually absent. Several theories are cited to account for the condition.

With regard to heterochromia, five cases only have been reported since 1905. P. A. HARRY.

(5) **Ruebel**, of Freiburg i. Br., had an opportunity of observing three brothers with this hitherto undescribed condition. There was no blood relationship between the parents, who were healthy, as were also the grandparents, one brother, and five sisters. The three affected persons, whose ages were 29, 32, and 34 years respectively, presented almost identical conditions.—There was obvious flattening of the anterior segment of the eye, the corneal and scleral curves being continuous, without the usual sulcus, and the boundary line irregular and ill-defined. In one patient there was a fine anterior synechia in one eye, but no evidence of corneal perforation. The media and fundi were normal. The corneæ were horizontally oval and smaller than normal, and the curvature very flat.

The affection is congenital, and is found only in male members of the family. The cases were under observation over a period of twenty years, during which the conditions showed no change. One of the patients was under treatment at the age of ten for parenchymatous keratitis, but the abnormality described was already established. There were no stigmata of congenital syphilis in any of the patients, and the Wassermann reaction, which was looked for in two of them, was negative. The question as to whether we are dealing with the results of a developmental defect or of an intra-uterine inflammation is discussed, especially in view of the corneal opacities, but no definite conclusion is arrived at. A. J. BALLANTYNE.

(6) In this case by **Traquair**, of Edinburgh, there was almost complete

absence of cilia and intermarginal zone, along which there were a few fine hairs lying flat on the surface. There was no evidence of the presence of Meibomian glands. A similar but less marked condition was found in the patient's father, several of whose relations were said to have suffered from "small and tender eyes."
A. H. PAYAN DAWNAY.

(7) The patient, a girl, had left ptosis, the lid margin being on a level with the upper edge of the pupil, and occasional nystagmoid jerks on lateral movement. Opening of the mouth caused an upward jerk of the left upper lid, the lid readily falling again; movement of the jaw to the right caused a more marked elevation of lid, which was sustained and constant. No such result was obtained by moving the jaw to the left. There were no other peculiarities.
A. H. PAYAN DAWNAY.

(8) **Hird**, of Birmingham, gives an account of fifteen patients affected with various forms of coloboma, twenty-six eyes showing the condition. He then deals with the subject from all points of view, taking each part of the eye which may be affected, with many references to recorded cases and pathological opinions. There is an extensive bibliography, and the paper will well repay reading in full.
A. H. PAYAN DAWNAY.

(9) **Grilli** describes a case of congenital polycoria, in which the left eye had three openings in the iris and the right four; in the left eye the anterior surface of the lens showed no abnormality, but in the right the portion of the surface corresponding to the largest "pupil," was the seat of deposit of pigment, resembling that left after iritis. In each eye below the openings, there was a yellow patch in the iris, the surface of which showed a waxy reflex; the iris surface generally showed little trace of crypts, and appeared atrophic.

A list of previously recorded cases is given. It is a singular commentary on the inaccessibility of British records that the striking case recorded by H. Work Dodd in the seventeenth volume of the *Transactions of the Ophthalmological Society of the United Kingdom*, p. 199, is not even mentioned.
HAROLD GRIMSDALE.

(10) **Hirsch**, of Prague, first gives details of three cases presenting lipo-dermoids of one or both eyes. Case I had two tumours on the left eye, one a typical dermoid of the corneo-scleral margin, the other a large lipo-dermoid of the transition fold. Case II had a dermoid of unusual size in the right eye, and in the left two tumours, one in the typical situation for dermoid of the corneo-scleral margin, the other high above it. Both had the appearances characteristic of subconjunctival lipo-dermoids. Case III had extensive lipo-dermoid growths in both eyes. This patient had numerous other malformations of the eyes, ears, teeth, etc.

It has been shown that the subconjunctival lipomata always contain epidermal elements, and the name "lipo-dermoid" has therefore been applied to these, along with the dermoids of the corneo-scleral margin. Nobbe classifies lipo-dermoids, according to their situation, into those occurring (1) at the corneo-scleral margin, (2) in the transition fold, (3) at the caruncle. Hirsch points out that of the five eyes of his three cases, only one showed a typical corneo-scleral dermoid. All the others were conjunctival lipo-dermoids, but none occupied the position considered characteristic by Nobbe, *viz.*, between the tendons of the rectus superior and rectus externus. Three of them showed a character not hitherto noticed. They were large kidney-shaped lipo-dermoids situated in the region of the outer canthus, and divided by the pressure of the external palpebral ligament into almost equal upper and lower halves. On the strength of these examples, Hirsch would add to Nobbe's three groups, a fourth, comprising lipo-dermoids of the outer commissure. One of his cases presented a conjunctival lipo-dermoid from which hairs were actually growing, Indeed, taking his cases together, it will be seen that they show transition forms between the typical corneo-scleral dermoid and the typical sub-conjunctival lipoma.

The author next refers to the congenital marginal opacities of the cornea found in his first and third cases, and often associated with the presence of corneo-scleral dermoids. They are apparently related to these tumours, being either remains of atrophied dermoids, or the result of the attachment of amniotic bands which have not produced true dermoids.

Encanthoschisis, the condition which gives the title to Hirsch's paper, is one of the abnormalities found in his third case. It does not appear to have been previously described.—It consists in a splitting of the caruncle into two by a horizontal furrow. In this case the two halves of the caruncle were, in the left eye, separated by a gap of 3 mm., while in the right eye there was merely a deep groove. In another case the right eye showed a small caruncle like the lower half of a divided caruncle, and absence of the plica, while in the left eye both plica and caruncle were absent. He looks upon these as further advanced forms of the same deformity, and they are all attributed to the action of amniotic bands.

A reference is also made to epicanthus, which is assumed to be due to the pressure of an amniotic band stretched across the root of the nose.

A. J. BALLANTYNE.

(11) **Velhagen**, of Chemnitz, reports the case of an infant presenting a yellow reflex behind the lens, which raised the suspicion of glioma retinæ and caused the eye to be removed.

Examination of the eye, after removal, showed that the appearance was due to the presence of a mass of tissue behind the lens, which was breaking into the substance of the latter through an opening in the centre of its posterior capsule. This mass of tissue was connected with a persistent hyaloid artery.

The author quotes eight previously recorded cases which in some respects resemble his own. He points out the difficulties in the way of diagnosis, and quite rightly states that the mistake of removing an eye under such circumstances is much less serious than that of leaving an eye which contains a glioma.

A. J. BALLANTYNE.

(12) Assuming, as does the author, that the internal ophthalmoplegia in this case is an accidental occurrence, probably a symptom of tabes, **Aurand**, of Lyons, has added one more to the list of fifty-four cases of this kind of enophthalmus collected by Duane in 1905, and also has added four cases from the literature since 1905. These four cases it may be as well to set down in this abstract for the benefit of others who may wish to go into the literature. They are by:—Green, J., *Ophthalmic Record*, February, 1906; Galezowski, J., *Sociéte d'Ophtalmologie de Paris*, 1909, first semester; Murray, A., *Ophthalmic Record*, September, 1909; and Brown, S. H., *Annals of Ophthalmology*, July, 1910.

Aurand's own case is thus epitomised.—(1) A recent affection which is an internal ophthalmoplegia in a (probable) incomplete tabes (*tabes fruste*). (2) A congenital affection, a syndrome characterised by the following symptoms:—complete absence of abduction, retraction of the globe during attempts at adduction, thus bringing about an intermittent enophthalmos which has been called active enophthalmus, and, lastly, a partial closure of the eyelids accompanying adduction.

ERNEST THOMSON.

(13) **v. Szily**, of Freiberg i. Br., stated that there were three methods of investigating ocular malformations: the clinical, the histological, and the experimental.

A definite distinction must be drawn between real malformation and deformity, the result of intra-uterine disease. The experimental method of research falls under two heads, natural methods by breeding from selected stock and teratological methods in which normal development is modified by various procedures, such as mechanical injury, deprivation of oxygen, or treatment with chemicals and poisons. v. Szily has used the last means of research. He has studied the action of chemicals upon the maturation of the hen's egg. Among other substances he employed salt, calcium chloride, magnesium chloride, alcohol, ether, and naphthaline. He found that all the chemicals he used could determine malformations in the embyro, but that it was not possible always to produce the same deformity, and, finally, that the same malformations could be caused by many methods. Deformities may result from a narrow amnion and from hæmorrhage.

The author has been unable to confirm Pagenstecher's results. The latter claimed to be able to produce various deformities by feeding with naphthaline, and suggests that the cataracts obtained were not really deformities, but degenerations due to the destructive effect of the naphthaline upon the previously normal lens. The only real defect produced by Pagenstecher was an eye with coloboma and lenticonus posterior. This is a common deformity in rabbits, and so its appearance may have been a coincidence. T. HARRISON BUTLER.

(14) **Pagenstecher**, of Strassburg-i.-E., has continued his experiments upon the production of ocular malformations by feeding rabbits with naphthaline, and has investigated the cases described to the Congress last year more closely. He finds that he had overlooked some of the deformities which accompanied the cataracts. In one case there was non-development of the anterior chamber, and in another posterior synechiæ between iris and lens capsule. Naphthaline is able to influence unfavourably the development of the zonula, the cornea, and the retina, as well as of the lens. All kinds of cataract may appear, and in one rabbit the lens had degenerated into a structureless mass. Two plates illustrate the paper.

T. HARRISON BUTLER.

V.—TOBACCO AMBLYOPIA.

(1) **Parisotti.—Retrobulbar neuritis due to alcohol and tobacco.** (**Nevrite retrobulbare d'origine alcoolica-nicotinica.**) *Rivista Italiana di Ottalmologia*, Giugno-Luglio, 1911.

(2) **Parisotti.—Tobacco amblyopia.** (**Ambliopia nicotinica.**) *Rivista Italiana di Ottalmologia*, Novembre-Dicembre, 1911.

(3) **Foster, M. L.—Toxic amblyopia due to tobacco alone.** *Archives of Ophthalmology*, July, 1913.

(1) This paper is an answer to one by Scalinci, in which he upholds the thesis that these cases of toxic amblyopia are really due to atheroma. **Parisotti**, of Rome, points out against this view that many of the subjects of this disease show no signs of atheroma, and that it is rarely possible to bring about a cure without abstention from alcohol and tobacco. A further point against the theory is, that women, although not uncommonly the victims of atheroma, are very rarely attacked by retrobulbar neuritis.

HAROLD GRIMSDALE.

(2) It is very rare to find a case of tobacco amblyopia in a person who does not either smoke or snuff.

Parisotti, of Rome, has observed a case of this nature.—The patient had been engaged in a factory of cigars from the age of 15 years. At the time of consultation she was 31; she was healthy, married, with four healthy children; she presented no trace of hereditary trouble. She had noticed a failure of vision about four years previously. For the last two or four months, she had suffered from pain in the head and constant disturbing scintillations. She saw better in a bad light. Externally there was nothing to note. By the ophthalmoscope, Parisotti observed some cloudiness covering, in the right eye, the whole disc and the lower half of the fundus; in the left eye, a similar cloud obscured the infero-temporal sector. In both eyes, the macular region was covered.

Parisotti was inclined to attribute these changes at first to vasomotor disturbances, of the nature of ophthalmic migraine. There was nothing abnormal in the urine.

Under bromide, the haze disappeared rapidly from the fundus, but there was no corresponding improvement of the visual acuity. Examination of the visual fields showed concentric contraction for white. The fields for red, green, and blue were also contracted, but there was inversion of the limits; in some places green extended even beyond white. The nervous system was examined and pronounced healthy. There was no sign of hysteria.

Parisotti thinks that even if the alterations of the fields were hysterical, the changes were probably excited by the intoxication and therefore due to the tobacco.

HAROLD GRIMSDALE.

(3) **Foster**, of Rochelle, N.Y., refers to the doubt which has been expressed whether tobacco alone can produce disease of the papillo-macular bundle of fibres.

The case he reports occurred in a man whose declaration of total abstinence was upheld by careful enquiries made among those who had known him for years, including his family physician. He had been an excessive smoker, and vision was reduced to R.E. 20/70, L.E. 20/200, with a central scotoma for red and such marked pallor of the temporal halves of the discs that they were unhesitatingly entered as atrophied. Treatment by immediate and complete abstention from tobacco and the administration of strychnine for eleven months, both subcutaneously and by the mouth, resulted in a return of vision to R.E. 20/10, L.E. 20/15, the disappearance of the central scotoma in the R.E. with only a tiny scotoma left in the L.E., and a complete return to normal of the discs.

Foster considers that even one case so definite as this is sufficient to establish the fact that toxic amblyopia can be caused by tobacco alone.

ROSA FORD.

VI.—APPLIANCES.

(1) Armaignac.—Double loupe for simultaneous lateral illumination and magnification. (Bi-loupe à grossissement et éclairage lateral simultané.) *Recueil d'Ophtalmologie*, juin, 1911.

(2) Rhoads, I. N.—Double cross cylinder. *Ophthalmic Record*, June, 1911.

(3) Kaz, R.—The plane lens for pretended amblyopia, and nervous asthenopia. (Das Planglas bei vermeintlicher Amblyopie und nervöser Asthenopie.) *Wochenschrift f. Therapie u. Hygiene d. Auges*, 8 Juni, 1911.

(4) Luedde, W. H.—Improved illumination for the Zeiss binocular corneal microscope, used in the study of the episcleral vessels and their circulation. *Archives of Ophthalmology*, July, 1911.

(5) Gallenga.—A stereoscope with travelling carrier for exercising binocular vision. (Stereosco pio a corsoio per esercizii di visione binoculare.) *La Clinica Oculistica*, Luglio, 1911.

(6) Hansell, Howard F.—Some experiences with the ophthalmo-diaphanoscope, with exhibition of the lamp. *Annals of Ophthalmology*, Vol. XX, July, 1911.

(7) Rhoads, John Neely.—A fenestrated six diopter concavo-convex axis disk. *American Journal of Ophthalmology*, October, 1911.

(8) Perlia, R.—A simplified stereoscopometer. (Ein vereinfachtes Stereoskopometer.) *Klin. Monatsbl. f. Augenheilkunde*, Oktober, 1911.

(9) Bielshowsky, A.—The heterophorometer: an apparatus for testing heterophoria at the working distance. (Das Heterophorometer: ein Apparat zur Prüfung auf Heterophorie in der Arbeitsdistanz.) *Klin. Monatsbl. f. Augenheilkunde*, Dezember, 1911.

(10) von Rohr.—On the latest attempts in the construction of ophthalmological instruments. (Ueber neuere Bestrebungen in der Konstruction ophthalmologischen Instrumente.) *Bericht der Ophthalmologischen Gesellschaft*, Heidelberg, 1911.

(11) Campos.—The true theory of the diploscope. (La véritable théorie du diploscope.) *Revue Générale d'Ophtalmologie*, décembre, 1911.

(12) Pfalz, G.—On stereoscoptometry. (Zur Stereoskoptometrie.) *Klin. Monatsbl. f. Augenheilkunde*, Januar, 1912.

(13) Stargardt.—A new illumination for test types. (Eine neue Sehprobenbeleuchtung.) *Zeitschrift für Augenheilkunde*, Februar, 1912.

(14) Schanz, W.—Two practical "wrinkles." (Zwei Notizen für die Praxis.) *Zeitschrift für Augenheilkunde*, April, 1912.

(15) Newcomb, I. R.—A convenient attachment for the De Zeng electric headlight. *Ophthalmic Record*, April, 1912.

(16) LeFever, C. W.—A light-hood for electric ophthalmoscope. *Ophthalmology*, April, 1912.

(17) Haase, Wilhelm.—Lighting attachment for eye instruments. (Leuchtstift zum Aufsetzen auf augenärztliche Instrumente.) *Klin. Monatsbl. f. Augenheilkunde*, Mai, 1912.

(18) Maddox, E. E.—A new mode of measuring muscle balance. *Ophthalmic Review*, June, 1912.

(19) Rhoads, J. N.—Tripling the distance of test cards by catoptrics. *Ophthalmology*, July, 1912.

(20) Wolff, H.—On centric micro-ophthalmoscopy without a reflex. (Ueber die zentrische reflexlose Mikro-ophthalmoskopie.) *Zeitschrift für Augenheilkunae*, Oktober, 1912.

(21) Bielschowsky, A.—A new universal prism apparatus. (Ein neurer "Universal Prizemen Apparat.") *Bericht der Ophthalmologischen Gesellschaft*, Heidelberg, 1913.

(22) Bouchart, A.—A contribution to the study of the diploscope. (Contribution à l'étude du Diploscope,) *L'Ophtalmologie Provinciale*, octobre, 1912.

(23) Visser, S.—A spectacle frame for skiascopy. (Eine Skiaskopbrille.) *Klin. Monatbl. f. Augenheilkunde*, November, 1912.

(24) Elschnig, A.—Fixation mark for the ophthalmometer. (Fixiermarke zum Ophthalmometer.) *Klin. Monatsbl. f. Augenheilkunde*, November, 1912.

(25) Cunningham, H. H. B.—Fusion pictures. *Transactions of the Ophthalmological Society U.K.*, Fasc. 3, 1912.

(26) Mason, Albert B.—A pupillary disc for the correction of spheric aberration. *Ophthalmic Record*, December, 1912.

(27) Rohr and Stock.—An achromatic spectacle-loupe of weak magnifying power. (Ueber eine achromatische Brillenlupe schwacher Vergrösserung.) *Klin. Monatsbl. f. Augenheilkunde*, Februar, 1913.

(28) Charles, J. W.—A convenient form of the Haitz stereoscopic chart for the investigation of central scotoma. *American Journal of Ophthalmology*, March, 1913.

(29) Black, Nelson M.—A practical electric perimeter. *Ophthalmic Record*, March, 1913.

(30) Wolff, Hugo.—On new methods of ophthalmoscopic examination. (Ueber neue ophthalmoskopische Untersuchungsmethoden.) *Zeitschrift für Augenheilkunde*, März und April, 1913.

(31) Ewing, A. E.—A protractor for use with the single trial frame. *American Journal of Ophthalmology*, April, 1913.

(32) Fourrière.—Clinical researches on the use of the Schiötz tonometer. (Récherches cliniques sur l'emploi du tonomètre de Schiötz.) *Ann. d'Oculistique*, avril, 1913.

(33) Löwenstein, Arnold.—A stereomicrocamera for clinical photography of the anterior segment of the eye. (Ueber eine Stereomikrokamera für klinische Photographie des vorderen Bulbusabschnittes.) *Klin. Monatsbl. f Augenheilkunde*, April, 1912.

(34) Rhoads, John Neely.—An instrument for holding a pair of lenses in front of a patient. *American Journal of Ophthalmology*, May, 1913.

(35) Baum, F.—A new ophthalmoscope without reflexes. (Ein neues, reflexloses Ophthalmoskop.) *Klin. Monatsbl. f. Augenheilkunde*, Mai, 1913.

(36) Perlia, R.—Yet another simplified stereoscopometer. (Nochmals das vereinfachte Stereoskopometer.) *Klin. Monatsbl. f. Augenheilkunde*, Mai, 1912.

(37) **Oppenheimer, E. H.—A new pupillary distance measure. (Ein neuer Pupillendistanzmesser.)** *Klin. Monatsbl. f. Augenheilkunde*, Mai, 1912.

(38) **Verhoeff, F. H.—Some simple attachments for electric hand lamps.** *Ophthalmic Record*, June, 1913.

(39) **Galezowski.—The disinfection of trial frames. (La désinfection des lunettes d'essai.)** *La Clinique Ophtalmologique*, 10 juillet, 1913.

(40) **Mayer, E.—A universal diagram for prescriptions. (Diagramme universel pour ordonnances.)** *Ann. d'Oculistique*, juillet, 1913.

(41) **Rhoads, John Neely.—A reflecting book-marker for teaching readers how to avoid strain.** *Ophthalmic Record*, August, 1913.

(42) **Maddox, Ernest E.—The wing test for heterophoria.** *Transactions Ophthalmological Society U.K.*, Vol. XXXIII, 1913.

(43) **Schanz, F.—The mirror sight for fire arms.** *Ophthalmology*, October, 1913.

(44) **Dufour, M.—Two ophthalmoscopes without reflexes. (Deux ophtalmoscopes sans reflets.)** *Ann. d'Oculistique*, octobre, 1913.

(45) **Walker, Clifford B.—Some new instruments for measuring visual field defects.** *Archives of Ophthalmology*, November, 1913.

(46) **Wilson, J. A.—Nystagmus.** *British Medical Journal*, November 22nd, 1913.

(47) **Crouch, J. F., and Clapp, C. A.—A modification of Würdemann's skiascope.** *American Journal of Ophthalmology*, February, 1914.

(48) **Moss-Blundell, C. B.—Test Type.** *British Medical Journal*, July 4th, 1914.

(1) **Armaignac**, of Bordeaux, finds the Berger *loupe* inconveniently short in focus for many manipulative measures in the eye, and has adopted the plan of fixing two + 12 D. or + 15 D. lenses together on a double universal joint, so that whilst one is supported in position to give a magnified view of the eye, the other lens at the same time gives a focussed light for illumination of the part observed. This arrangement is very convenient for the extraction of foreign bodies from the cornea, the cauterisation of corneal ulcers, etc., and by separating the lenses, one or other can also be used for indirect ophthalmoscopy. J. JAMESON EVANS.

(2) **Rhoads,** of Philadelphia, has further improved on his crossed cylinder described in the *Ophthalmic Record*, April, 1909. The latter had to be inverted or turned 90° every time it was used. The form now described is a double one which does not have to be turned or reversed, as the outer half of the instrument marked + ·25 has its *plus* axis parallel with the long axis of the instrument, and the inner half, marked — ·25 has its *minus* axis also parallel to the instrument's long axis. The instrument is carried on a handle 3½ inches long fixed at an angle of 45°. J. JAMESON EVANS.

(3) **R. Kaz**, of St. Petersburg, employs a plane lens for diagnosis and treatment of the pretended or nervous asthenopia of school children.* When prescribing, he often combines a very slight smoke or bluish tinge with the lens.

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* The paper has been published in two sections already: Diagnosis—*Klin. Monat. f. Augenheilkunde*, 1910, Juli; Treatment—*Rev. Inter. d'Hygiene et de Thérap. Ocul.*, 1911, Mai.

He considers these are often cases of retinal asthenopia. When the condition recovers, the spectacles should be given up. W. B. INGLIS POLLOCK.

(4) **Luedde** has added an incandescent Tungsten lamp, supported on an extension arm jointed and freely movable, and claims that this illumination is excellent, while the independence of the mechanism of the lamp from that of the microscope makes the instrument much more convenient. A plain polished glass as base has also, in his experience, proved very useful in allowing the free movement of the microscope in all directions.

(5) **Galenga** has mounted his stereoscope on a stand, and has furnished a long rod on which the traveller moves by means of an endless screw.

HAROLD GRIMSDALE.

(6) **Hansell,** of Philadelphia, quotes cases in which the diaphanoscope has been used. His conclusions are: "The light is invaluable in the diagnosis of orbital tumours; thickening of the walls of the orbit; and in growths in the posterior half of the eyeball, and it is of the greatest aid in the transillumination of the anterior cells of the sphenoid, the ethmoid, and of the antennæ." JOHN WHARTON.

(8) **Perlia**, of Crefeld, remarks on the importance of space-perception in relation to occupation, and the part it can play in accident insurance claims.

His instrument (made by Schumacher, optician, Crefeld) has some useful features.—The patient, looking over a screen at the bulbous tip of a vertical rod, in the first place tries to touch it with the end of another rod which he holds in his hand. Then the observer takes the latter rod, and, bringing it down in different positions, asks the patient to tell whether it is before or behind the fixed point. The vertical rod, whose tip forms the fixation object, can be carried to any distance up to 60 cm. from the eye. This enables the test for stereoscopic vision to be made to some extent under working conditions. A. J. BALLANTYNE.

(9) The apparatus devised by **Bielschowsky**, of Marburg-a-L., resembles somewhat the common American stereoscope. The eyes look through two 5° prisms, one edge up and the other edge down. At a distance of 33 centimetres is a card divided by horizontal and vertical lines, whose distances from the central point are the tangents of 5°, 10°, etc. A green arrow is placed vertically at the centre, whose length occupies the space corresponding to 5°. With a red glass before one eye the arrow is black, while the other image is green. Vertical and lateral deviations are easily measured. The author thinks his appliance an improvement on the Maddox rods.

A. J. BALLANTYNE.

(10). The paper by **v. Rohr**, of Jena, dealt with two instruments designed by Gullstrand—the ophthalmoscope without a reflex and telescopic spectacles.

The improvements in the reflexless ophthalmoscope are described and illustrated. The new departure is the adaptation of the aspherical lenses already used in photography and microscopy to the ophthalmoscope. The adoption of the lens system used in the common opera glass to the telescopic spectacles, has enabled the firm at Jena to eliminate chromatic aberration. The spectacles originally invented for high myopes have been adapted for the use of moderate ametropes. T. HARRISON BUTLER.

(11) Once more the diploscope! This paper, by **Campos,** of Cairo, is interesting, but does not lend itself to useful abstraction.

(12) On physiological grounds, **Pfalz,** of Düsseldorf, criticises the method advocated by Perlia (for abstract see above), for the measurement of perception of depth, by his simplified stereoscoptometer. He also holds that many of the reports given with regard to the faculty of space perception in injured workmen indicate that the examiners do not understand the

physiology of the subject. Methods like the Hering drop test can only prove the presence or absence of the "binocular stereoscopic parallax," and cannot give a measurement of the faculty of depth perception. Moreover, they are of no use in a one-eyed man. Depth perception with two eyes involves the binocular stereoscopic parallax, and the muscular sensations associated with convergence and accommodation. Monocular depth perception depends on the monocular stereoscopic parallax, obtained by movements of the head, and the sensations resulting from convergence and accommodation. In a physiologically exact method there must be no change of the position of the fixation objects except in a direction to and from the eyes. Lateral movements, shadows, apparent changes in height with different distances, visibility of the mechanism, and all other aids, must be avoided. In the interests of exact and comparable records, there must be standard size of fixation objects, standard positions of the objects as regards lateral separation and distance from the patient, and the objects must all be, and move, at the level of the eyes.

In Pfalz's stereoscoptometer three vertical rods, each tipped with a small ivory knob, are placed side by side at a definite distance from the eyes. The task of the examinee is to move the centre rod towards or from him, until the three are in line. A screen hides the mechanism from the patient. Pfalz enters on a detailed critiscism of Perlia's instrument, the substance of which is that there are, in its use, too many inconstant factors, and that the patient has sources of information which vitiate the results. Moreover, he does not agree with Perlia's claim that his test enables him to examine blacksmiths and other workmen under conditions approaching those of their work. That can only be done by observing men under actual working conditions.

He gives some conclusions arrived at as the results of his researches, among which are the following.—With full vision in one eye and vision of 1/10 or even less in the other, binocular depth perception can be normal. Even considerable loss of sight in the better eye need not destroy it. Monocular perception of depth may be so perfect as to satisfy the demands of any occupation. With his instrument, if no greater error is made than ½ c.m. he considers the result perfect. If a one-eyed man, from 35 to 40 years of age, resumes his former occupation, he recovers his working capacity fully in from six months to one year. If he is over 40 at the date of his loss, it may require two years.

A. J. BALLANTYNE.

(13) **Stargardt**, of Kiel, is dissatisfied with all the usual methods of illuminating test types. He himself uses a 400 candle power Nernst lamp without any glass. This lamp lights up the whole wall upon which the types are hung. It is quite impossible to gather where this lamp is placed in the room or how the patient is shielded from its glare. The paper, while giving mathematical formulæ of light intensity, omits these somewhat practical details.

T. HARRISON BUTLER.

(14) **Schanz,** of Dresden, has devised two little instruments which really appear to be very practical.

The first is a phorometer for near vision. A double scale, like the Maddox tangent scales for distance, is engraved upon a tablet with a handle just like those upon which reading tests are mounted. One scale is vertical, the other horizontal. They intersect at zero, where there is a hole. Behind the holes is an electric light. Using a Maddox rod and correcting the displacement with a prism, it is possible to detect and measure the heterophoria at any desired working or reading distance.

The second "wrinkle" consists of three lenses mounted on three stems which have a common pivot. The lenses are —1, —2, —4, and on another instrument of a different coloured metal +0·5, +1, +2. These lenses combined give a fair choice of lenses, and are useful in making a rough determination of the refraction before the trial lenses are used.

Both pieces of apparatus can be obtained from R. Wurach, Berlin C. Neue Promenade 5. T. HARRISON BUTLER.

(15) **Newcomb**, of Indianapolis, obviates the necessity of using the street current and rheostat with the De Zeng electric headlight by having a 3½ volt pocket battery attached to his head band by means of a single metal strip. The lamp used is a 3½ volt Tungsten. J. JAMESON EVANS.

(16) **Le Fever**, of Philadelphia, has found difficulty in the use of the electric ophthalmoscope to arise owing to the wide divergence of the rays proceeding from the mirror. He overcomes this by placing over the end of the lamp tube a small vulcanite cap with an opening 5 mm. in diameter, which acts as a diaphragm to cut off the divergent peripheral rays.
A. J. BALLANTYNE.

(17) **Haase**, of Homberg, figures and describes a small lamp which can be attached to instruments such as those used for removal of foreign bodies, for electrolysis of hairs, for discission of cataract, etc. It is a five candle power lamp, worked from a 2½ volt battery, and weighing only 20 grammes. It is provided by Wurach, Berlin. A. J. BALLANTYNE.

(18) This test by **Maddox**, of Bournemouth, is supplementary to the rod test, and is useful for measuring cyclophoria and other deviations in near vision. It consists of two pieces of celluloid, one green, the other red, each with a perforated pattern so arranged that one colours the pattern of the other; the patient views these with the glasses used in Snellen's "Friend" test. The surgeon can observe the movements of the patient in order to put the patterns together, and can preserve the position of the celluloid sheets by clipping them together. In this test the patterns are displaced in the same direction as the eyes see them, and not in the opposite, as in the case of the rod test. A. H. PAYAN DAWNAY.

(19) Instead of using a card of reversed types and reflecting it once so as to double its apparent distance, **Rhoads** advises the use of a card of unreversed types, which is hung on the wall opposite and is reflected first by a mirror on the wall behind the patient and again by a mirror on the opposite wall. He finds that the repeated reflection does not cause an appreciable reduction in the illumination of the types, and the arrangement allows the surgeon to obtain an apparent distance of 20 feet in a room seven feet square.
A. J. BALLANTYNE.

(20) **Wolff,** of Berlin, describes his micro-ophthalmoscope, which utilizes the catoptric principle instead of the more usual dioptric method. The light is reflected into the eye by a small mirror which utilises half the pupil, and reflects light from an obliquely-placed optical system. The other half of the pupil is used to observe the interior and exterior of the eye by means of a system of lenses which act as a microscope. In this way the various reflexes are not received by the microscope, which gives a highly magnified image of the object. With a similar instrument Wolf has obtained photographs of the fundus of his own eye. The whole field is sharply defined and the smallest details of the retina can be made out, details which are only partially seen with the ordinary direct vision ophthalmoscope. The normal pulse of the retinal arteries is perfectly visible. A stereoscopic ocular may be employed and it affords a stereoscopic picture of the retina which is of great value. The instrument is equally available for the examination of the vitreous, the lens, and the cornea—in fact, it may be used as a corneal microscope. If it is adjusted so that it transmits light through the retina, it shows up small tumours which are invisible by any other method. T. HARRISON BUTLER.

(21) **Bielschowsky,** of Leipzig, has arranged a new form of phorometer. It consists of a pair of double rotating prisms, like the Maddox prism verger. Each has a value of 15°, so a prism effect from 0° to 30° can be attained. A frame is provided to hold test glasses or a Maddox rod and on the other side coloured glasses or diaphragms can be placed. The universal apparatus serves as a phorometer: it measures the amplitude of fusion; it measures a squint angle objectively and subjectively; it can be used for fusion training; and, lastly, to unmask malingerers. It costs about 11 guineas, and is made by Zeiss & Co. T. HARRISON BUTLER.

(22) In a long article which does not lend itself to abstracting, **Bouchart** describes a modification of Remy's diploscope. The article is illustrated with numerous diagrams.

(23) The device illustrated and described by **Visser**, of Lochem (Holland), consists of a reversible spectacle frame on each side of which three lenses are so mounted that they can be slid into or out of the visual axis singly or in combination. The lenses on one side are —2, —4, and —8 dioptres, and on the other side + 2, + 4, and + 8 dioptres. Visser performs skiascopy by artificially producing a myopia of one or two dioptres, and, then, with the plane mirror, finding the far point. With the above set of lenses one can measure myopia as high as 16D. and hypermetropia as high as 13D., keeping the far point always from ½ to 1 metre from the eye. An extra clip is attached on each side, so that by inserting an extra lens, higher degrees of ametropia can be measured. The frame can also be used for skiascopy at a fixed distance, using lenses of—1, —2, —4, +1, +2, and +4 dioptres. These give measurements up to 7D., and higher errors can be measured by inserting an extra lens. A. J. BALLANTYNE.

(24) In order to make it easy for amblyopic eyes to fix steadily the centre of the aperture of the ophthalmometer, **Elschnig,** of Prague, fixes in that position a small electric lamp which is in circuit with the lamps which illuminate the mirrors. An independent rheostat makes it possible to vary the intensity of the light. A. J. BALLANTYNE.

(26) **Mason,** of Atlanta, uses a perforated disc with a slide having holes varying from 2 mm. to 6 mm. in the testing of refraction cases which are under a cycloplegic. The idea is that the test should be carried out with an aperture corresponding to the normal size of the pupil, so as to avoid the effects of spherical aberration. J. JAMESON EVANS.

(27) The instrument of **Rohr** and **Stock**, of Jena, consists of two *loupes* of the Chevalier-Brücke type mounted on a spectacle frame. They give a two-fold magnification, have a working distance of 25 centimetres, and weigh from 15 to 27 grammes, according to the refraction of the observer for whom they are constructed. They are made in each case with a fixed inter-pupillary distance. They have been found to give good binocular vision with a satisfactory freedom from aberrations. Zeiss is the maker.

A. J. BALLANTYNE.

(28) The calculation involved in order to prepare the charts by **Charles**, of St. Louis, must be studied in the original.

(29) The electric attachment by **Black**, of Milwaukee, is designed to fit any McHardy perimeter. The test object and the fixation point can be varied in size and operated independently, each being on a separate circuit, and the fixation point is raised in front of the arc, so that the test object can pass beneath it in taking the central field. The illumination of the object and fixation spot can be varied in intensity, and may be used intermittently or constantly as desired. Absolute spectral colours are used for the coloured test objects. The electric current is supplied by a dry battery with rheostat.

In the discussion of this instrument it was remarked that the coloured fields obtained by it are much larger than those obtained by reflected light of day, and that some means of standardizing the amount of light used in electric perimeters is necessary, in order that the results of different observers can be compared. J. JAMESON EVANS.

(30) Those ophthalmic surgeons who are experts upon the dioptrics of the eye and upon optics in general will read this communication by **Wolff,** of Berlin, with pleasure. The paper is well illustrated, with good diagrams of the new instruments described. It will be remembered that Wolff has contributed other papers to the *Zeitschrift* upon dioptric and catoptic methods of examining the eye. One of the instruments described is a stereoscopic ophthalmoscope. T. HARRISON BUTLER.

(32) **Fourrière**, of Paris, continuing his researches on the clinical use of the Schiötz tonometer, has investigated the tension of eyes suffering from various forms of glaucoma and the effect of miotics on them. In a case of prodromal symptoms he found definite increased tension when the functional troubles were most marked. In acute glaucoma he found the tension always 70 mm. or higher. In subacute glaucoma he found tensions varying from 27 mm. to 83 mm. in cases in which the other eye was in a state of absolute glaucoma. In some apparently unilateral cases he found the tension raised in the eye which was supposed to be sound, and in others it was within the healthy limits, but subject to variations of 4 mm., 6 mm., or 8 mm. within a few days, while in a third group of these cases the tension of the healthy eye kept consistently normal. In two cases of infantile glaucoma the tension was 60 mm. In simple chronic glaucoma the tension varied from 55 mm. to 16 mm. In secondary glaucoma from various causes the tension varied from 40 mm. to 105 mm.

With regard to the action of miotics, pilocarpin in 2 per cent. solution usually has a favourable influence on the tension, but in some cases it rapidly loses its effect. In a certain number of instances it has no effect. Eserine has an action similar to that of pilocarpine, but more energetic and more rapid. The reduction in tension which it causes is sometimes preceded by a slight and transitory increase.

The article contains *résumés* of cases which will repay perusal in the original. R. J. COULTER.

(33) **Löwenstein**, of Prague, has, with the help of the firm of Zeiss, designed a stereoscopic camera which magnifies from 1½ to 5 times. It is an adaptation of the Zeiss-Czapski corneal microscope, and a constant source of light is provided by a specially designed arc lamp, which is shaded during focussing. The necessary exposures are short, ¼ to 2 secs., according to the magnification. A. J. BALLANTYNE.

(34) The instrument, by **Rhoads**, of Philadelphia, consists of a bar to be held horizontally, at the end of which are two clips for holding trial case lenses. It is intended that these lenses should be held in front either of the patient's own glasses or in front of the frame from the trial case. ERNEST THOMSON.

(35) This is a new ophthalmoscope, electrically lighted, for which **Baum** claims that it is free from disturbing corneal reflections, that it gives good illumination and a good field, that it is small in size, simple in construction, and easy to work, and that its cost is moderate. It is made by Sydow, Berlin, N.W., 6, Marienstrasse, 10. The author has christened it the "Pikkolo." A. J. BALLANTYNE.

(36) Perlia's instrument was described in the *Monatsblätter* of November, 1911, and criticised by Pfalz in the number for January, 1912. **Perlia,** of

Crefeld, now replies to Pfalz's criticism. This, he says, was founded on a misunderstanding of his article, and he holds that Pfalz's objections to his apparatus are not justified. He maintains that his method is superior to those of Pfalz and others, since it tests the patient's space perception under conditions as nearly as possible approaching to those of practical life. It ascertains (1) the patient's power of estimating the relative positions of several points, and (2) the power of projecting objects to their proper positions in space. The second is found by causing the patient to strike a small object, in a way which closely imitates a number of actions which involve reflex association of hand and eye. A. J. BALLANTYNE.

(37) In the instrument described and figured by **Oppenheimer,** of Berlin, the patient, wearing his distance correction, looks through a large + 3 D lens at a small cross situated at the principal focus of the lens, The eyes are therefore directed straight forward. Through the eyepiece, which is situated behind the cross, the observer looks at the patient's eyes, and, by means of a screw, adjusts two pointers to the pupillary distance, which is then read off on a scale. A. J BALLANTYNE.

(38) **Verhoeff**, of Boston, U.S.A., has devised some very useful attachments for the extended use of pocket electric lamps and electric ophthalmoscopes in ophthalmology. By means of a rubber "teat" of an eye-dropper and a lens of short focus a transilluminator or an improved focus-lamp can be improvised. Another attachment for testing central colour vision is made from a thermometer case and a piece of perforated thin hard rubber in which the openings are filled in with coloured screens made of pieces of photographic film, stained with microscopic stains, and fastened on with with Canada balsam. J. JAMESON EVANS.

(39) **Galezowski,** of Paris, observes that there is a risk of infection of one patient by another through the trial frame. To obviate this risk, some antiseptic must be used for the frame which will not damage it. Galezowski employs chloroform contained in a wide-mouthed bottle. One-thousandth part of absolute alcohol is added to preserve the chloroform. The bottle is of yellow glass and, of course, well stoppered. After each patient, the trial frame is placed for a few seconds in the chloroform and is then withdrawn and placed on sterilized gauze to dry. ERNEST THOMSON.

(40) **Mayer,** of Paris, recognises that the attempt of the International Ophthalmological Congress to introduce a uniform notation for the axes of cylindrical lenses has failed, and suggests a plan of his own to overcome the difficulty This consists in a single chart, like a compass, with a line for each 5° but no figures. He proposes that the refraction should be entered on this as it is ordinarily written when doing a retinoscopy, with letters to indicate whether the figure entered refers to the right or left eye and to distant or near vision, and that the optician should be left to work out the proper lenses from it.

The proposal would certainly get rid of the debateable figures on the prescription card, but even if it were otherwise practicable, they would still remain in our private and published case records. R. J. COULTER.

(41) **Rhoads,** of Philadelphia, has devised a book-marker of bright aluminium which will indicate how a book may be held to produce injurious reflections, and on the reverse side instructions are given how these reflections may be avoided. J. JAMESON EVANS.

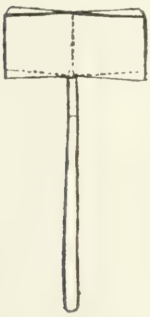
(42) A description of **Maddox's** (of Bournemouth) ingenious test for all kinds of heterophoria at reading distance would involve transcription. We must be content to say that the principle of the tests for lateral, vertical, and

rotatory deviations is that of making each eye see only its own portion of the field by means of the adjustable "wings" situated between the sighting slits of the apparatus and the test objects. ERNEST THOMSON.

(43) In the arrangement described by **Schanz**, of Dresden, the fore-sight of the rifle is replaced by a small mirror and the back-sight by a white mark which the marksman can see in the mirror. As the image of the back-sight is as far in front of the fore-sight as the actual object is behind it, the difficulty which the presbyope has in shooting because he cannot focus the back-sight is removed. The contrivance is said to give greater ease and accuracy than the telescopic sight or other optical aid. A further advantage of the mirror sight is that by making the white back-sight luminous by means of a small lamp fed by a pocket battery, sighting can be done in the dark, or at least in a light so poor that the target is only dimly visible and sighting by the usual method would be quite impossible. The apparatus is illustrated, and there are also diagrams showing the actual shooting results obtained by it in Germany. A. J. BALLANTYNE.

(44) This paper is a report of a demonstration of the principles of the reflexless ophthalmoscopes of Thorner and Gulstrand by **Dufour**, of Nancy, at the Lariboisière Hospital in Paris.

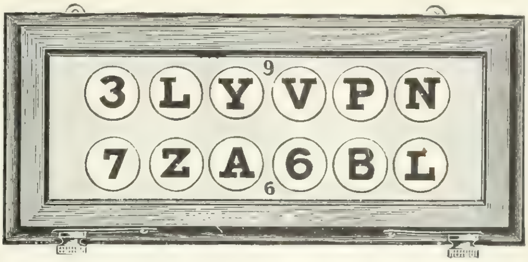
(45) **Walker**, of Boston, finds the mechanically acting perimeter unsatisfactory in that the centre of the field defects are difficult to determine, and it is here that most accuracy is required ; it is time-consuming and it is impossible to obtain all colour readings rapidly in the same colour phase of time without giving a clue to the patient that the colour is being changed. To remedy these defects, Walker uses circular discs of different sizes with 1 sq. cm. as a unit, and varying from 1/64 sq. cm. to 16 sq. cm. with an extra one of 9 sq. cm. The rod which bears two of these discs, one at each end, is very thin to avoid attracting the patient's attention, and each disc is fixed at right angles to the other, so that only one is seen at a time. Colour discs, 1/4 sq. cm. circles, are placed in an instrument looking like a tonsillotome, in the handle of which is an arrangement whereby the discs can be changed unnoticeably at will. To "blind" the other eye, a shield is used affixed to the eye by a light spring passing over the head and thus can be attached to this a "macular selector" for use in cases where the eye under examination has lost central fixation. Through this the patient can see an area of about 1 sq. cm., about the fixation point. ROSA FORD.



(46) **J. A. Wilson**, of Glasgow, has devised an ingenious method of studying the comitance or otherwise of nystagmus. Two 12 degree square prisms are placed edge to edge and interposed between the observer and the patient. By moving the appliance nearer to or farther from the patient, the eyes are seen to approximate and to separate, and a distance can be selected at which the corneæ are seen edge to edge, when the movements of the eyeballs can be studied. In order to obtain magnification, it is convenient to place on the patient's face a trial frame armed with a +20 D. spherical lens in front of each eye. SYDNEY STEPHENSON.

(47) **Crouch** and **Clapp**, of Baltimore, have been dissatisfied with Würdemann's lenses in handles, in that the dioptric spacing between his twenty-six lenses is too large after 1·51, and, further, that the instrument is cumbrous. The authors have arranged a much greater number of lenses in a number of hard rubber frames. Each frame contains sixteen lenses, set in two rows of eight each. ERNEST THOMSON.

(48) **Moss-Blundell**, of Huntingdon, has devised a movable type, a cut of which is shown below. The type is mounted on a ribbon, which travels behind a white plate, with circular apertures. The appliance measures 10 in. by 4 in. by 1 in., so that it can be conveniently carried in a hand-bag. It is made by Davidson and Co., Great Portland Street, London, W.



SYDNEY STEPHENSON.

VII.—OPERATIONS.

25.—The Eyelids.

(1) **Machek.—A ptosis operation with formation of a cover fold in the upper lid. (Eine Ptosisoperation mit Bildung einer Deckfalte am oberan Lid.)** *Archiv f. Augenheilkunde*, Januar, 1914, S. 8.

(2) **Carruccio.—Total blepharoplasty after the method of Cirincione. (Sul rifacimento d'una palpebra in toto col processo Cirincione.)** *La Clinica Oculistica*, Gennaio, 1914.

(2) **Carruccio**, of Sassari, gives an account of the various methods of forming a whole lid when one has been destroyed by malignant disease, and shows that the old methods are not satisfactory. Landolt's operation, by which he made use of the upper lid to form the new lower, suturing the upper down to the raw edge left after the removal of the tumour and later making a new palpebral fissure, is not always successful, since the skin contracts and gives rise to ectropion of the conjunctiva. Cirinicione has improved on Landolt's method by dividing the remaining lid into two planes, working through the grey intermarginal line, and has sutured the deeper plane, the conjunctiva and tarsal plate, down to the margin of removal; he has then allowed the skin of the lid to retract and has covered the raw surface left with a graft of skin taken as a pedunculated flap from the temple. By this method he has obtained very good results. Carruccio thinks that it embodies all the good points of its predecessors without any of their disadvantages.

HAROLD GRIMSDALE

26.—Cataract.

(1) **Lamb, Robert Scott.—Cataract extraction with conjunctival bridge.** *Ophthalmic Record*, November, 1913.

(2) **Valude.—A note on cataract operation with or without iridectomy. (Note sur l'opération de la cataracte avec ou sans iridectome.)** *Ann. d'Oculistique*, avril, 1914.

(3) **MacGillivray, Angus. — Subconjunctival cataract extraction.** *Edinburgh Medical Journal*, May, 1914.

(4) **van Lint.—Temporary paralysis of the lids in the operation for cataract. (Paralysie palpébrale temporaire provoquée dans l'opération de la cataracte.)** *Annales d'Oculistique*, juin, 1914.

(5) **van Lint.—Post-operative astigmatism in the sliding flap operation for the removal of cataract. (Astigmatisme post-opératoire dans l'extraction de la cataracte avec glissement de la conjonctive.)** *Annales d'Oculistique*, juin, 1914.

(6) **Mackay, George.—Notes on the treatment of two cases of double congenital cataract.** *Ophthalmic Review*, August, 1914.

(1) **Lamb,** of Washington, says "doubtless someone has tried the procedure to be described. If so, I have been unable to find a description of it."

His procedure is that which generally goes by the name of subconjunctival extraction, and has been recommended in later years by Czermak and others. According to Haab,* it was practised at the beginning, middle, and end of the last century by Alexander, 1825; Desmarres, 1851; Von Hames, 1873; Pansier and Vacher, 1899. J. JAMESON EVANS.

(2) **Valude**, of Paris, considers that when extracting a cataract the operator ought, above all things, to guard against the occurrence of after-cataract, and that an iridectomy is the best means of preventing this complication, which is of more importance than prolapse of the iris. He has, therefore, given up performing simple extraction of the lens, and prefers, when possible, to do a preliminary iridectomy. R. J. COULTER.

(3) **MacGillivray**, of Dundee, briefly describes the various methods of subconjunctival extraction of cataract as practised and recommended by Czermak (1903), Dimmer (1907), Cluckie (1909), and Bajardi (1910). In selected cases he has himself adopted the plan. For example, suitable cases are those in which prolapse of vitreous is anticipated from a weakened suspensory ligament, those who are unlikely to submit to post-operative discipline, those who suffer from a chronic cough, and particularly those patients with such obvious sources of sepsis as chronic dacryocystitis or diplobacillary infection of the conjunctiva. MacGillivray describes the *technique* he follows, and the precautions he adopts. In conclusion, he gives details of three cases in which subconjunctival extraction was successfully adopted. SYDNEY STEPHENSON.

(4) In order to prevent contraction of the orbicularis palpebrarum during the performance of cataract extraction, **van Lint**, of Brussels, partially paralyses the muscle in question by injecting novocaine and adrenaline into the terminal branches of the facial nerve which innervate the orbicularis. A tablet containing novocaine 0·05 gr. and adrenaline 0·000,083 gr. is dissolved in 5 c.cm. of water or of physiological serum when it is about to be employed, or two *ampoules* of novocaine 0·02 gr., adrenaline (1 : 1,000) i drop, sodium chloride 0·006 gr., and water 1 c.cm. are mixed with an equal quantity of physiological serum, Of this solution of 1 per cent. novocaine van Lint injects 3 to 4 cubic centimetres. The injection is made at two points, the exact position of which is shown by the accompanying diagram. Partial

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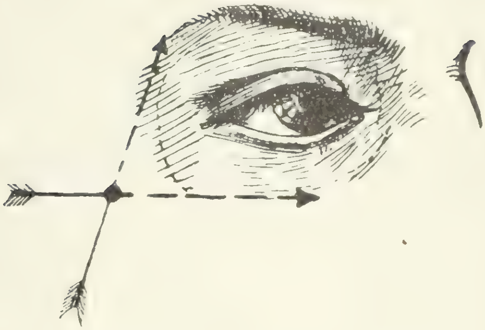
* "Atlas and Epitome of Operative Ophthalmology."



paralysis of the muscle follows about twenty minutes after the injection has been made. The operation may be carried out half to one hour after the injection.

SYDNEY STEPHENSON.

(5) *Apropos* his method of cataract extraction (see THE OPHTHALMOSCOPE, 1912, p. 563), **van Lint**, of Brussels, maintains that it is followed by less astigmatism than the forms of extraction more commonly practised. Thus, in eleven patients, examined by the Pfister and Streit astigmometer four to twelve weeks after operation, the astigmatism varied from 1 D. to 4 D., and averaged 2·81 D. For purposes of comparison it may be stated that in the third month after ordinary cataract extraction Masson found an average of 4 D. and Gagnieux of 3·75 D. of astigmatism.

SYDNEY STEPHENSON.

(6) The case brought forward by **Mackay**, of Edinburgh, was one of bilateral congenital cataract in a tuberculous baby of thirteen months. At an interval of twenty-five days, each lens was "needled" in the usual way. It is a curious circumstance that at each operation the denser nuclear portion of the cataract was dislocated into the anterior chamber. The point of the case, however, is summed up by the author in the following words: "The treatment of the right eye was concluded in six weeks, and that of the left eye in a day or two less, and as the procedures overlapped, a period of ten weeks practically covered the treatment of both eyes."

SYDNEY STEPHENSON.

27.—Miscellaneous.

Thomson, Ernest.—On certain considerations which influence the question of operation in ophthalmic surgery. *Clinical Journal*, December 17th, 1913.

Readers of THE OPHTHALMOSCOPE will not have forgotten the series of brilliant articles recently published in its columns by **Ernest Thomson**, of Glasgow, as the result of visits he paid to some of the more important Continental clinics.

The present communication is to some extent based upon the same material. It is of a thoroughly practical nature, and deserves to be widely read and pondered by those concerned.

Thomson takes a conservative attitude, and common-sense and caution abound in almost every line of his valuable communication.

No eyeball should ever be opened unnecessarily and without a full sense of responsibility on the part of the surgeon. As influencing the question of operation, three points have to be considered: the general health, the age of the patient, and the number of effective eyes he may chance to possess.

The question of alcohol is important. Apart from drunkards, careful enquiry should be made beforehand as to the usual amount of alcohol, since it often happens that such an individual, especially if advanced in years, will be a much better patient if a certain amount of stimulant be allowed for several days after the operation. "The surgeon and the practitioner," says Thomson, "may uphold the principles of total abstinence, but discretion is the better part of valour." Speaking of mental derangement, the author believes that forced abstention from alcohol and tobacco, in those accustomed to these as sedatives, may be contributory causes of mental trouble. It is well to avoid double bandaging.

The author can scarcely be persuaded to operate upon the eye of a one-eyed individual unless sure of one or other, or both, of two things: (1) that the eye, as it stands, is visually useless, and without prospect of spontaneous improvement; and (2) that there exists a progressive disease, leading to blindness, which has a chance of being stopped by operation.

Thomson treats practically of the considerations that govern, or should govern, the question of operation in cataract, high myopia, and strabismus.

In cases where senile cataract is limited to one eye, he discusses impartially the *pros* and *cons* of operating in such a contingency. In intelligent patients it appears to be his rule not to urge or even to admit the advisability of operation as long as the cataract is in the very least immature. On the other hand, when the cataract is fully mature, Thomson thinks it best to operate, in order to prevent over-ripeness. In dealing with juvenile congenital cataract, particularly of the lamellar type, Thomson holds a strong opinion that the so-called "slow" method—that is, by "needlings," repeated as often as may be necessary—is much the safer. He makes many reservations on the subject of operating for high myopia. The risk of sepsis may be small, but the risk of disturbing a diseased vitreous and uveal tract is a constant one, not only in myopia, but also in any eye in which those parts are affected. He concludes that "the operation is practically always too risky." Retinal detachment may follow operation as well as occur spontaneously in a highly myopic eye; but, as he points out, in the latter case the surgeon cannot be blamed, whereas in the former he is only too likely to be held responsible for the complication. With respect to spontaneous detachment in myopia, the writer does not think that either the surgeon or the patient stands to lose anything in the event of failure to improve the sight by operation.

Thomson is out-spoken on the subject of advancement *v.* tenotomy, and his remarks on the point will be endorsed by many practical men. The risks of converting a convergent squint into a divergent one as a result of tenotomy are not great, provided the operation is skilfully performed. During his twenty years of experience at the Glasgow Eye Infirmary, the author has seen many cases tenotomised by his predecessors, and has but seldom met with divergence as a result, and in some of these the tenotomy had undoubtedly been too freely performed. He is far from denying that a skilful advancement is the best operation for convergent concomitant strabismus, and it is, indeed, the only operation in divergent strabismus. But under many circumstances, advancement, in his view, may give place to the older and less fashionable method of tenotomy to the advantage of the patient. Advancement means loss of time and the expense involved in loss of time, and Thomson questions whether we always, or even generally, gain by that operation such advantage in the result as will compensate. The author concludes with the following words:—

"It is true that a badly performed tenotomy may indeed give a very poor "cosmetic result, and that tenotomy should not be undertaken, especially in "children, without a full study of the case, but in adults, who can ill afford "the time or the money for lying up, a simple tenotomy, carefully performed, "which requires no confinement to bed, which can be carried out between a "Saturday and a Monday, and after which a patient can return to work in a "few days, often will give a cosmetic result which completely satisfies the "patient and costs him but little." SYDNEY STEPHENSON.

CORRESPONDENCE.

[While THE OPHTHALMOSCOPE will at all times welcome correspondence from its readers, the Editor does not hold himself responsible for any views expressed in this column.]

PERISCOPIC LENSES.

To the Editor of THE OPHTHALMOSCOPE.

DEAR SIR,

There are one or two slight misprints at the foot of page 393 in my paper on Periscopic Lenses of last July.

Line 13 from bottom read "distances (v_1 and v_2) from E."

Line 11 from bottom read "$\frac{\mu \cos^2 \phi'}{v_1} - \frac{\cos^2 \phi}{u} = \frac{\mu}{v_2} - \frac{1}{u}$ etc."

Line 5 from bottom read "the distances from F (v' and v'') of the focal lines."

Last line read "$\frac{\cos^2 \psi}{\mu v'} - \frac{\cos^2 \psi'}{u_1} = \frac{1}{\mu v''} - \frac{1}{u_2}$ etc."

These may seem to be trivial slips that are hardly worth noticing, but there is one oversight for which I am wholly responsible:—The value of r in the table for the + 8D. meniscus in the table should be ·0020952 not ·0010952.

There is one important advantage of periscopic lenses that I did not mention, which perhaps I may be allowed to notice now.

When using glasses for near work, the object generally presents a flat surface, so that when ranging the eyes laterally through an angle of 25°, the distance of the point seen is appreciably greater than when the part immediately opposite the eyes is viewed. For instance, if this part be 300 mm. from the glasses, when looking eccentrically at an angle of 25°, the point seen is 152 mm. (*i.e.*, six inches) from the middle line, and is 331 mm. distant from the glass; hence a stronger concave (and a weaker convex) glass is required for seeing this lateral point. A patient who requires — 8D. for seeing an object 300 mm. distant, will require — 8·3D. for seeing an object 331 mm. away. My periscopic lenses tend to correct this peculiarity, for my — 8D. lens for near work has a power of — 8D. centrically, and — 8·12D. eccentrically. The ordinary bi-concave when viewed eccentrically at an angle of 25° has the effect of a — 9·381D. lens, a far stronger power than the — 8·3D. which is required.

Similarly, if a bi-convex lens of + 8D. is used at the same distance, its "eccentric power" is 1·285D. greater. But, as stated above, the power required should be less, in fact, ·3D. less, and my periscopic + 8D. lens gives ·6D. less when viewed eccentrically at an angle of 25°, an error of less than 4 per cent.

Yours truly,

A. S. PERCIVAL.

CONJUNCTIVAL ŒDEMA AS EVIDENCE OF FILTRATION.

To the Editor of THE OPHTHALMOSCOPE.

DEAR SIR,

In the July number of THE OPHTHALMOSCOPE, Messrs. Jameson Evans and Harrison Butler make the following observation: "We have had cases in which apparent free filtration has been associated with no lowering of tension, and we would ask whether conjunctival œdema can always be accepted as proof of filtration? We are convinced that pitting to a probe, Elliot's test, is no evidence of filtration. It can be seen in normal eyes upon which no operation has been performed, and is well marked near the practically invisible scar of a cataract section."

The question appeals to me personally, as it is now a number of years since I first drew attention to conjunctival œdema as evidence of filtration, shown by pitting with a probe (see *Transactions Ophthalmological Society, U.K.*, Vol. XXIII (1903), p. 334; THE OPHTHALMOSCOPE, Vol. V (1907), p. 293; "Cataract Extraction" (1908), p. 155. I am convinced that œdema is a sign of practical value in judging the later results of many glaucoma operations, and that it will have more value in this connection in the future, when, as I believe, the linear filtering (non-fistulous) cicatrix will be more generally aimed at.

Since the above references are all to matter published before Lt.-Col. Elliot's glaucoma work began, it is surely incorrect to speak of pitting as "Elliot's test."

Pitting of the normal conjunctiva varies considerably in different patients, but it is only rarely that this physiological pitting is so marked as to interfere with the recognition of the wider and deeper pits which indicate conjunctival filtration. Comparison with the conjunctiva of the fellow eye, or of the same eye in the region opposite to that of the operation scar, often serves to demonstrate a moderate œdema.

There is at present some difficulty in explaining the not uncommon cases in which after operation the tension is reduced, with absolutely no recognisable œdema. In some, at least, of these cases the absence of œdema is not permanent. Shortly after a successful sclerotomy for chronic simple glaucoma there may be no abnormal pitting, but gradually in the course of some months moderate œdema develops. Obviously, therefore, minimal, but effective, filtration may go on for a few months without noticeable effect upon the conjunctiva.

On the other hand, in advanced glaucoma, with the filtration angle presumably more or less closed, there may be definite filtration-œdema, and yet the leakage may be insufficient and the tension imperfectly reduced.

Concerning the formation of filtering cicatrices after cataract extraction, Dr. Derrick T. Vail (p. 471 of July issue) quotes some remarks of mine in support of the opinion that "whatever may be said in favour of the (conjunctival) flap incision, the cystoid scar stands against it." I am sorry if my description was not sufficiently explicit. The truly filtering scars of which I wrote were not at all "cystoid," and were in no way objectionable, apart from the astigmatism often resulting from them. Yours truly,

H. HERBERT.

CASTLE GROVE,
NOTTINGHAM.

NOTES AND ECHOES.

Deaths.

We regret to report the death, which took place on July 26th last, in his fiftieth year, of Gerald Allpress Simmonds, radiographer to the Royal Westminster Ophthalmic Hospital, W.C.

The death occurred on May 31st of William Edward Hamill, one of Toronto's best-known ophthalmic surgeons. He leaves a widow and one daughter.

The death is announced at the age of 70 years of Robert C. Moon, of Lansdowne, Penna., well-known for his work among the blind.

The following deaths have occurred among American ophthalmic surgeons: Charles J. Spratt, of Minneapolis, aged of 65 years; Edward W. Blake, of Tahlequah, aged 44 years; William F. Robeson of Pittsburg, aged 50; James A. Blake of Brooklyn, aged 71; William H. Searles of Oshkosh, Wis., aged 74; William S. Ross of Altoona, Pa., aged 60; James G. Schall of Leadville, Colo., aged 38; and George Strawbridge of Philadelphia, aged 68.

* * * *

Appointments.

Edward Hugh Edwards Stack has been appointed ophthalmic surgeon to the Bristol Royal Infirmary, *vice* Alexander Ogilvy, deceased.

M. W. B. Oliver has been appointed assistant ophthalmic surgeon to the Miller General Hospital.

Geoffrey Viner has been appointed assistant surgeon to the Royal Westminster Ophthalmic Hospital.

H. V. White has been appointed assistant surgeon to the Manchester Royal Eye Hospital.

Randal Herley has been appointed ophthalmic surgeon to the Dewsbury and District Infirmary.

William Stirling has been appointed resident surgical officer to the Manchester Royal Eye Hospital.

Charles T. Hirsch has been appointed anæsthetist to the Western Ophthalmic Hospital, London.

It is interesting to note that Mr. P. G. Doyne, the son of Mr. Robert W. Doyne, late reader in ophthalmology in the University of Oxford, has been appointed junior ophthalmic house surgeon to St. Thomas's Hospital, London.

* * * *

International Ophthalmological Congress.

Towards the end of July notice was received by Mr. W. H. H. Jessop, the English representative, that the International Ophthalmological Congress, which was arranged to be held at St. Petersburg on August 10th, had been postponed.

* * * *

Workmen's Compensation Act. 1906.

THE Secretary of State has recently (1st July) amended the Order of 30th July, 1913, by substituting for the words "epitheliomatous cancer or ulceration of the skin or of the corneal surface of the eye, due to pitch, tar, or tarry compounds," which appear in the first column of the schedule to the Order, the words "epitheliomatous cancer or ulceration of the skin or of the corneal surface of the eye, due to tar, pitch, bitumen, mineral oil or paraffin, or any compound, product or residue of any of these substances."

* * * *

? Another Ophthalmological Society.

A RUMOUR has reached us that an attempt is about to be made to form a Northern Counties Ophthalmological Society.

* * *

The Middlemore Prize, 1914.

WE gather that four essays on the Physiology of Vision and Fusion were submitted in competition for the Middlemore Prize, 1914. In view of the adjudicators' report, which was to the effect that the essays did not attain the standard which might be reasonably expected in this prize essay, the council of the British Medical Association has decided not to award the prize this year.

* * *

British Medical Association.

AT the annual meeting of the British Medical Association, recently held in Aberdeen, the discussion on the teaching of ophthalmology to medical students was opened by Dr. A. Maitland Ramsay, of Glasgow. After a full discussion of this somewhat knotty point, on the recommendation of Mr. T. H. Bickerton, of Liverpool, seconded by Dr. Angus MacGillivray, of Dundee, a resolution was passed urging the necessity of an examination in ophthalmology for all medical students.

* * * *

Diploma in Ophthalmology, Oxford.

OF the fifteen candidates who presented themselves in July last for the Diploma in Ophthalmology of the University of Oxford, those whose names are given below satisfied the examiners:—Welcome Herbert Adams; Herbert Caiger; Henry George Frean; George Montagu Harston; Reinhard Carl Johannes Meyer; Albert Guy Miller; B. Kesava Narayan Rau; Gangadhar Ramchandra Tambe.

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ORIGINAL COMMUNICATIONS.

SOME POINTS IN CONNECTION WITH THE OPERATION OF SCLERO-CORNEAL TREPHINING.*

BY

R. H. ELLIOT, M.D., F.R.C.S.,

LONDON, ENGLAND.

IT is proposed in the present paper to deal with some of those difficulties and dangers of the operation of trephining, which can be minimised or avoided by the adoption of a correct *technique.*

(1) **The Vesicular type of Filtration Scar** has been spoken of by some of those who have not had practical experience of sclero-corneal trephining, as if it were a necessary sequel of the operation. Fortunately, however, this is very far from being the true state of the case. The suggestion has been that the conditions of trephining are such as to limit the channel of fluid escape to a very small and circumscribed area, and that the out-rush of fluid at this point will result in a ballooning of the covering flap, and in the localisation of the area of conjunctival filtration to the neighbourhood of the trephine hole. It cannot be disputed that the above-traced sequence of events may be found after the operation, but experience shows that they are to be attributed to faulty *technique,* and I propose now to deal with this subject. The matter is one of no small importance, since vesicular scars must necessarily carry with them two dangers, *viz.,* (1) the risk of abrasion of their prominent surfaces during movements of the globe, and (2) that of infection through any chance organism which may be breeding in the conjunctival *cul-de-sac,* in consequence of the scanty protection which is afforded by a very thin covering of the filtration area.

Technique.—The flap made must be as large as possible, the first incision passing almost up to the fornix, and the extremities of this incision must be kept well away from the limbus. The type of incision which I first advocated was triangular with both points of the incision resting on the corneal periphery, and in the event of the cut edges of conjunctiva healing down to the subjacent sclera, a typical vesicular scar was the result, since the area available for filtration was then limited to that enclosed in the small triangle so mapped out. It is not even necessary to make the conjunctival incision concentric with the limbus: it is sufficient to make a long cut slightly concave downwards, *i.e.*, towards the cornea.

Secondly, the whole area outlined by the flap must not be dissected up; indeed, there is everything to be said against such a procedure. If we do this, we find that at the close of the operation the flap falls limp and inert over the cornea, and requires to be stitched in to keep it in place. Moreover, we convert the whole space under the flap, for the time being at least, into one large lake, as it were. Our aim should be to produce a wide area for slow filtration, in which the meshes of the tissue are damaged as little as possible; in doing so, we must avoid two evils, *viz.,* on the one hand, the formation of large fluid reservoirs, and, on the other, the destruction of our filtering area by the formation of cicatricial bands running between the flap and its bed. We shall best attain our object by reducing the area we dissect to a minimum, and leaving as much as possible of the connective tissue of the flap uninterfered with. The path of the dissection, from the conjunctival incision, as a base, to the limbus, must resemble in shape a truncated triangle, very wide above, and gradually narrowing below until it reaches the cornea, when its width is only sufficient to allow of our having room comfortably to carry out the necessary manipulation for the splitting of the cornea. If this *technique* is adopted, the tissue at the sides of our wound remains undamaged, and thereby a double advantage is gained:—(1) a check ligament-like action of the tissue thus left, springs the flap back into position as soon as the downward drag on it is released, and so makes it lie in good position without being stitched, and (2) the widest possible area of undamaged subconjunctival tissue is left for the purposes of filtration.

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*A paper read before the Clinical Congress of Surgeons of North America, in London, on July 31st, 1914.

Thirdly, whilst the upper half or more of the flap need include little more than the conjunctiva itself, we should as we approach the limbus, work down to the sclera and should lay the latter bare in the last few millimetres of our dissection. By so doing we ensure the base of the flap being made as thick as possible. I believe that the formation of projecting vesicular scars is due to the neglect of this very obvious indication.

Lastly, we come to the splitting of the cornea, and I desire here to lay emphasis on the point that what we should aim at is to "split" this membrane, and not merely to cut it. Mr. Sydney Stephenson examined some eyes sent home from Madras in which the operation of trephining had been performed by some of my pupils out there, and in which the procedure had failed to give relief. I would emphasize the point that the splitting of the cornea had been correctly performed, as, indeed, had all the steps of the operations. Microscopical examination showed that the splitting had taken place along the interlamellar spaces, and that individual lamellæ could be traced for long distances in the sections. Later still, Captain Reinhold, I.M.S., who did a number of trephinings in my hospital in Madras, very kindly undertook to split some corneæ in the dead-house, and to send the eyes home to me. These eyes were very kindly examined by Mr. Fison, who found, just as Mr. Stephenson had done, that the dissection had passed between the layers of the corneal lamellæ. This fact is of very great importance. I think it must be obvious that we could not in any case have worked with a flap the corneal portion of which was limited to the corneal epithelium and Bowman's membrane, and that all conjunctivo-corneal flaps must include some of the corneal lamellæ. Much would appear to turn on just how much of the corneal thickness is included in the flap. This much at least one can say with confidence, that the thickness of the corneal base of the flap can be easily made such that the resulting wound covering is not vesicular in type.

If this *technique* is carefully followed, we do not find the localised filtration which has been so adversely criticised. I do not say that we never get scars in which the filtration is not more abundant and marked in the neighbourhood of the trephine hole than elsewhere. Some such we do get; they may be spoken of as "pad-formation filtering scars." Whilst they are far from being ideal, they differ widely from the thin prominent vesicular scars which are the product of faulty *technique*; we have to do with a filtering area, having a comparatively thick covering, and not with a thin-walled projecting vesicle, whose cavity leads directly into the interior of the eye. A more perfect type of filtration scar, and one not seldom obtained, is that in which the covering conjunctiva is smooth and even, passing off insensibly from the neighbourhood of the trephine hole to the surrounding area; yet gentle pressure with a spud shows that free and abundant filtration is taking place. In many such cases the œdema due to filtration of fluid can be demonstrated to be very well marked near the trephine opening, and to fade away as we pass away from this area; moreover, if we freely massage the eye, we find that the œdematous area increases both in depth and in extent, until in some cases pitting can be shown to exist the whole way round the cornea. Indeed, I have seen cases in which, even apart from massage, the area of œdema was as wide as the bulbar limits of the conjunctiva.

There is a point in connection with pitting of the conjunctiva under spud pressure, to which I may refer shortly.—It has been pointed out that many old eyes will show a measure of such pitting after firm instrumental pressure. This is quite true; I would even go farther and add that many eyes, not necessarily aged, in which there has been chronic obstruction to the venous outflow, such as is found in glaucoma, will present the same phenomenon. There is, however, no real difficulty in distinguishing the œdema due to filtering fluid from that due to these causes. It is both more fluid and more strongly marked. When the œdema is so little marked as to lead to confusion, we may, I think, be sure that the filtration it represents is of little value to the patient.

(2) **The impaction of uveal tissue in the trephine hole** is, to my mind, one of the gravest misfortunes that can overtake a surgeon in the performance of a sclero-corneal trephining. In view of the fact that my time is limited, and that I have so often dealt fully with this subject on former occasions, I propose to take the above dictum as accepted without challenge, and to pass on directly to discuss (*a*) how such impactions may take place, and (*b*) how they can best be dealt with when they do occur.

Either the iris or the ciliary body, but, in the first case at least, by far more frequently the former, may become impacted in the trephine hole. Such impactions may take place:—(1) as the result of injudicious traction during the iridectomy; (2) in consequence of a sudden movement of the patient at that time; (3) owing to a forward movement of the structures lying behind the diaphragm of the eye, which mechanically push the uveal tissue into the wound, and block them there; and (4) as a result of the iris becoming washed into the hole by the fluid which is making its way from the anterior chamber to the subconjunctival space. The last-named factor differs from the other three, in that it comes into play after the patient has left the operation table.

Intimately bound up with three out of four of the above causes of impaction is the important question to which so many and such different answers have been returned.—Is it either necessary or advisable to perform an iridectomy in the course of the operation of sclero-corneal trephining? Some prominent ophthalmologists have suggested that the whole value of the modern sclerectomy operations lies in the iridectomy, to which the advocates of sclerectomy have assigned such a very secondary *rôle*. Despite the honoured names which have been associated with such a view, I think that the experience of the many surgeons, who have found that when an iridectomy is omitted, the results are quite as good as when a piece of iris has been excised (always provided that the wound does not become blocked with uveal tissue), has settled this question definitely for us. It is undoubtedly advisable to perform an iridectomy, but such a step is not a *sine quâ non*. We can now advance the enquiry a step farther and ask a second question.—Should an iridectomy be invariably performed, and, if so, should it be partial or complete? Speaking practically, I think that an iridectomy should always be performed, if possible, and my own preference is in favour of a peripheral button-hole iridectomy, made opposite the trephine hole. A sluice-gate is thus provided for the escape of aqueous fluid, and the risk of the iris being washed into the wound is thereby greatly diminished. Some surgeons, whose experience and position entitle their opinions to careful consideration, and, amongst others, Dr. Parker, of Detroit, hold that there is less danger of quiet iritis if an iridectomy is done, and less still if that iridectomy is made a complete one. It must, however, be remembered that there are certain grave objections to performing a complete iridectomy when it can be avoided, *viz.*, (1) it tends to cause blurring of images, (2) it exposes the patient to unnecessary dazzling, and (3) it deprives the surgeon of the power of inducing strong miosis, should he require so to do. Moreover, I wish to put forward the suggestion that the alleged avoidance of quiet iritis is apparent rather than real, and that this is probably to be attributed to the greater mydriasis found after complete iridectomy. The outcome of this suggestion would be that surgeons should use atropine freely as a routine step in the after-treatment of their cases, beginning not later than 48 hours after operation and in doubtful cases even 24 hours after.

If the *technique* I have so often advocated of performing the iridectomy with the same snip of the scissors that divides the hinge of the disc, is adopted, it will but rarely happen that the iris will become impacted in the trephine hole, for the firm grip on the disc enables the operator to steady the eye whilst the iris is being cut across, even although the patient may be troublesome and restless.

When impaction of iris has actually occurred, it is important to make up our minds, whether this is due to tissue having been dragged into the wound by our faulty manipulation, or having been pushed there by the pressure of structures behind. Time does not permit of my discussing this important subject at length, and I must therefore be content to say that the leading sign of the latter condition is a sudden hardening of the eye whilst the patient is still on the table; the condition is clearly due to an effusion (probably a transudation from the choroidal veins) into the posterior segment of the eye. Under these circumstances, any prolonged manipulation, such as the effort to push back protruding uveal tissue with a bent spud, is inadvisable. The patient should be quickly and quietly got back to bed. On the other hand, if the eye has remained soft, it is not difficult to effect replacement of impacted uveal tissue with a spud, should the irrigator stream alone prove insufficient.

(3) **The control of the result obtained by a correct gradation of the piece of sclera removed.**—It is obvious that if we are to obtain the best results, the size of the piece of sclera removed must vary in different cases, and that the necessary control for this purpose must not be difficult of attainment. In a very chronic case of non-congestive glaucoma, we have to remember that (*a*) a very small fistula will almost certainly suffice to drain off the small amount of fluid, whose removal is necessary for the maintenance of a normal intra-ocular tension, and (*b*) provided our aseptic *technique* is perfect, we have nothing to fear from a filling up of the trephine hole by proliferative tissue. Under such circumstances, the removal of one-third of the disc outlined by a 2 mm. trephine will suffice for our purposes. On the other hand, take the case of an eye with a very high tension, and with a history of repeated inflammatory attacks, and presenting at the time of operation all the clinical evidence of acute or sub-acute congestion. Here there is a double indication for the making of a large opening, *viz.*, (i) the need for a free drainage channel, in order to cope with the comparatively large volume of fluid which presumably needs to be drained away, and (ii) the necessity of allowing for the possibility that the hole will tend to be closed by connective tissue, owing to the inflammatory condition present. Between

these two extreme cases, many intermediate forms will lie. I shall very shortly review those principles of *technique*, by means of which we can exercise very considerable control over the size of the fistula we aim at establishing between the interior of the globe and the subconjunctival space.

Our object should always be to make the blade of the trephine cut through first on its corneal edge, and in order to effect this we must slope the upper end of the instrument a little toward the patient's feet, and not hold it perpendicular to the surface of the eye. As soon as the trephine has cut its way through, the disc, hinged on its scleral side, will be pushed forward by the prolapsing bead of iris. We seize both disc and iris in a single grip of the iris forceps, and turning the parts out, cut them across with one clean snip of the scissors, taking care to cut at right angles to the surface of the disc, so as to produce a fistula which does not slant, but is of the same calibre throughout its whole extent. It is not in the least difficult to remove the whole disc, or any fractional part of it that we desire to remove in the interests of the individual case. A refinement of *technique* is reserved for cases in which we desire to remove a very small piece of scleral tissue. We then increase the slant of our blade in such a way that the hinge left comprises a full third of the circumference of the disc. A small piece of tissue is removed as usual from the corneal side, and a minimum of surgical violence is thus inflicted.

If the above method is closely followed, two consequences of importance will follow.—(i) The fistula will be removed as far as possible from the dangerous neighbourhood of the angle of the chamber, and (ii) in cutting the hinge, the risk of button-holing the flap will be reduced to a minimum. On the other hand, if our trephine blade enters first on the scleral edge, we bring our fistula nearer to the angle, and we have to divide the sclera in very close proximity to the reflection of the delicate corneal portion of the flap.

(4) **Late Infections.**—We have alluded already to this very unfortunate class of cases in which we meet with late infections, and have indicated some of the means to be taken in order to avoid such misfortunes overtaking us. Time permits now of only a very few words.

I am far from wishing to belittle the great importance of late infection; but I think that there has been a tendency in some quarters to lose sight of some important considerations which cannot be overlooked without a danger of our losing a proper sense of proportion.

(1) During the last four years a very large number of trephinings has been performed. Some idea of the number may be judged from the fact that sclero-corneal trephining alone has claimed about 500 references in medical literature during the last three years. Like all other operations, it has its dangers and its failures, and it is a matter for no surprise that amongst these disasters there are on record fourteen cases of late infection. I anticipate that still more will be published soon, but I enter the plea that account should be taken of the proportion that such failures bear to the enormous number of cases operated on.

(2) The condition for which we trephine is not one in which the patient can choose whether he will be operated on or not. He has his back to the wall, and we are fighting for his sight. Risks are then justifiable which would not be worth taking for an operation for cosmetic purposes.

(3) As I have pointed out, those risks may be greatly reduced by the adoption of a correct *technique*.

(4) Late infections are on record as occurring after other operations beside trephining, *e.g.*, after cataract extraction, after Herbert's operation, after Lagrange's operation, and even, if I am not mistaken, after iridectomies.

(5) Some at least of the cases classed as late infections are open to challenge, on the ground that they occurred too early, and should be returned as ordinary operation infections, or that they followed blows and other injuries.

(6) The great stress that has been laid on "thin flaps" in this connection, although very desirable, may be exaggerated, if it leads surgeons to forget the importance of two other factors, *viz.* (1) the inclusion of uveal tissue in the wound, and (2) the possibility of the existence of a fistulette somewhere along the line of the original conjunctival incision; such a fistulette may easily provide a channel of infection. Fortunately, however, it is as easy to recognise such a fistulette as it is easy to close it, a touch of silver nitrate solution sufficing for the purpose

THE SCLERO-CORNEAL TREPHINING OPERATION FOR GLAUCOMA.*

BY

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THERE are two methods by which the details and *technique* of an operative procedure may be developed and perfected: one is by the critical observation of clinical phenomena, and the other by the study of pathological specimens and physiological processes.

Colonel R. H. Elliot, with a vast amount of clinical material at his disposal, and with remarkable ingenuity, has devised for us the operation of sclero-corneal trephining, a simple, safe, and effectual method of establishing a permanent filtration scar for the relief of glaucoma.

From the time when de Wecker first introduced his operation of sclerotomy many have sought to attain this end. I myself endeavoured to reach it from the pathological standpoint, directing my attention to the microscopical examination of sections of eyes in which cystoid cicatrices had accidentally formed after operations for glaucoma or the extraction of cataract. Although these researches failed in the direction in which Colonel Elliot has succeeded, they have, I think, enabled me to realise certain essential physiological factors in his procedure which it would be well for every operating surgeon to bear in mind, instead of proceeding by mere rule-of-thumb.

In the sections of all the cystoid scars which I examined I found that there was an entanglement of a piece of the iris. In some the entire posterior surface of the scar was lined by the stretched and atrophied iris, whilst in others it was so lined in a portion of its extent. I came, therefore, to assume that an entanglement of the iris was an essential factor in the formation of a filtration scar. It was not until I had the opportunity of examining some cases of Colonel H. Herbert's with scars through which undoubted filtration was taking place, where the pupils were round and regular, and the iris intact, that I realised that this assumption was incorrect.

Sufficient specimens of satisfactory filtration cicatrices, free from entanglements of the iris, have not yet been examined histologically to show how they differ from those through which filtration does not take place.

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* Communication read before the Clinical Congress of Surgeons of North America, held in London, on July 31st, 1914.

What we know, however, of the healing of wounds of the eye affords us fairly conclusive presumptive evidence on this matter.

I propose to divide up what I have to say as to the conditions necessary for the formation of a filtration cicatrix under four headings:

(a) The establishment of a permanent gap in the endothelium of Descemet's membrane the most essential feature in the operation.

The experiments of Leber demonstrated that what prevents the filtration of the aqueous humour into the *substantia propria* of the cornea is the endothelial lining of Descemet's membrane.

He removed the cornea and tied it over the end of a glass tube; then attempted to force water through it from the posterior surface. As long as the endothelium was intact, no fluid passed into the cornea, but when the endothelium was removed, it readily penetrated into the tissue, making it opaque, and causing the surface epithelium to become raised in the form of vesicles.

From this experiment it would seem that the first essential factor in the formation of a permanent filtration scar is to establish a permanent gap in the endothelium lining Descemet's membrane.

After a simple perforating wound of the cornea, the divided ends of the posterior elastic lamina retract, carrying with them their endothelial lining. Whilst the opening in the endothelium exists, aqueous humour filters through it, causing the lips of the wound to swell and to form a fibrinous coagulum between them. The divided endothelium quickly proliferates, and extends over the posterior surface of the coagulum. When it is again intact, further filtration becomes arrested.

In a perforating wound of the eye the restoration of the continuity of the endothelium of Descemet's membrane may be impeded in various ways, under which circumstances the filtration of the aqueous humour through it is prolonged or rendered permanent:

(1) The inclusion of a fold of iris, or a piece of lens capsule, between the posterior lips of a wound interferes with the extension across it of the endothelium.

(2) The endothelium at the margins of the wound may be so extensively damaged, either mechanically or chemically (as by the use of strong antiseptics), that its reformation is less easily accomplished.

(3) The gap formed in the tissue at the seat of the wound may be so wide that the endothelium is unable to extend across it.

This latter is what probably occurs in connection with the operation of sclero-corneal trephining, which renders it so eminently successful. A piece of the whole thickness of the sclero-corneal tissue at the limbus, 1·5 mm. or 2 mm. in diameter, is removed, and the possibility of the endothelium being able to extend round the whole of the inner surface of such a gap is exceedingly unlikely.

Elliot has frequently laid stress on the importance of making the trephine hole well forwards and to some extent entirely in clear cornea. It is, I suggest, always desirable that the piece removed should include a complete disc of Descemet's membrane and not encroach on the ligamentum pectinatum, which in many cases of glaucoma has the root of the iris in immediate contact with it.

I have found experimentally that the line of junction between clear cornea and opaque sclerotic on the surface of the globe is 1 mm. internal to the position where Descemet's membrane commences to split up into the fibres of the ligamentum pectinatum. If, therefore, a 1·5 mm. trephine is used and the centre of it is placed over the margin of the cornea on the surface of the globe, a complete disc of Descemet's membrane will be found on the posterior surface of the piece excised.

There are two reasons why it is undesirable that the opening should be made further inwards than is necessary to ensure the removal of a complete disc ot Descemet's membrane : (1) because the escaping fluid has ultimately to be taken up by the blood vessels which terminate at the sclero-corneal margin, and the nearer the channel of exit from the eye is to them, the more easily is such absorption effected ; and (2) because the filtration of aqueous humour into clear cornea makes it opaque.

In the performance of a sclero-corneal trephining, a complication sometimes arises, due to the escape of the aqueous humour before sufficient of the circle has been cut with the trephine to allow of the disc springing forwards. Under such circumstances it seems dangerous to continue the use of the trephine, and the disc has to be picked out with forceps. In doing this, the whole or part of Descemet's membrane and its lining endothelium, from the posterior surface of the disc, may be left behind. The gap in the endothelium then formed may not be sufficiently wide to check its continuity becoming restored, when the filtration of fluid through the scar will become arrested and the tension of the eye again become increased.

(b) How the patency of the opening made in the sclero-corneal tissue is maintained.

It is now a well-established fact, although I do not know who first pointed it out, that after removal of a portion of the iris, the cut surface, if kept aseptic, and bathed by the aqueous humour, does not close. No granulation tissue is formed, and the appearance of the wound is the same years after the injury as when it was first inflicted. In an avascular tissue like the cornea, as may be easily understood, there is, under similar circumstances, even less tendency to the formation of granulation tissue than in the vascular tissue, like the iris.

The edges of a corneal wound kept aseptic and bathed by aqueous humour fail to unite. In most wounds of the cornea the extension of the endothelium over the posterior surface shuts off the aqueous humour. A continuous stream of it then ceases to flow over the lips of the wound, which become agglutinated by a coagulum that forms a basis for the development of cicatricial tissue.

In the operation of sclero-corneal trephining, where a wide gap is left in Descemet's membrane which cannot be bridged over by endothelium, the edges of the wound remain permanently bathed by the aqueous humour escaping from the eye. Provided the parts are kept aseptic, no granulation tissue is formed to fill up the trephine hole, which persists as a permanent channel or fistula.

(c) Importance of the conjunctival flap in preserving a sterile condition of the trephine hole.

Elliot has always insisted on the great importance of making a large conjunctival flap. The chief value of such a flap is, I suggest, that it tends to preserve the trephine hole free from contamination with micro-organisms in the conjunctival sac.

It is doubtful if we can ever safely ensure the conjunctival sac being completely free from the presence of micro-organisms previous to the performance of an operation. Micro-organisms which are saprophytes in the uninjured conjunctiva (such as the staphylococcus albus and xerosis bacillus), may, when that structure is wounded, find at the injured part a suitable soil in which to multiply. Such organisms have not sufficient pathogenic powers to produce any changes in a structure with intact epithelium. When, however, the surface epithelium is abraded and their numbers are greatly increased, they may generate sufficient toxine to start a mild inflammatory reaction.

It is important, therefore, in order to preserve the trephine hole from contamination with such organisms, that it should not coincide in position with the opening in the conjunctiva. A mild infective inflammation started in the trephine hole excites the production of granulation tissue which may lead to its closure.

To such infection is probably also attributable the mild quiet iritis which has been observed sometimes to follow the operation. As a safeguard against the disasters that may arise from this complication, Elliot advises the early and systematic use of atropine after operation.

(d) Importance of the conjunctival flap in preventing downgrowth of surface epithelium.

After a perforating wound of the cornea, there is always some retraction of its lips at the anterior surface. Into the wedged-shaped space thus formed the surface epithelium dips down, and soon proliferates to such an extent as to restore the normal level anteriorly. Should delay take place in the agglutination of the lips of the wound, the surface epithelium extends down deeper, and may even spread along the whole length of the wound into the anterior chamber. In some cases it has been known, in course of time, to have completely lined the anterior chamber and established an incurable condition of glaucoma.

In the operation of sclero-corneal trephining, an endeavour is made to establish a permanent gap in the sclero-corneal tissue. In order that the surface epithelium may not find its way into the trephine hole, it is important that the opening made in the former should be as far removed from the latter as possible. The formation of a large conjunctival flap obviates such a complication. It might, however, arise, if in dissecting up the flap, a button-hole was accidentally made in it just opposite the position of the trephine hole. Elliot's plan of splitting into the anterior layers of the cornea tends to lessen the risks of this accident.

THE PRESENT STATUS OF THE HETEROPHORIA QUESTION.*

(Continued.)

BY

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Diagnosis of Heterophoria.

A few words as to methods of diagnosis may not be amiss. Nearly every method employed to-day, falls in one of three classes, namely :—

1st. The diplopia test as first employed by von Graefe. Familiar examples of this principle are to be found in Stevens' phorometer and the Maddox prism verger.

2nd. Distortion or deforming tests. In these one image of the light is so distorted by some manner of refracting device, that the normal tendency to fusion is momentarily set aside and any latent deviation tendency revealed. The Maddox rod (simple or compound) is the almost universally employed type of this test. Many other devices have been advocated from time to time, but none has equalled the Maddox rod in simplicity, ease of use, and accuracy.

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* A communication read before the Oxford Ophthalmological Congress on July 10th, 1914.

3rd. The cover or screen test, which dates back many years. It furnishes so much useful information, so quickly, and so easily, that it should be resorted to in every case.

Those who choose to carry the last-named test further by asking the patient to tell whether the object surveyed seems to jump or not, as the cover is carried from side to side, will sometimes elicit some interesting information. This test (the parallax) was first described by Alfred Graefe and has been popularized in the States by the persistent advocacy of Alexander Duane. It has ofttimes been of great service to me.

Whatever test or tests are used for infinity should be supplemented by tests at the reading or occupation distance (35 centimetres as an average). von Graefe's original single prism method is still in vogue, but the Maddox tangent scale is a much more useful device. Remy's diploscope and Harman's diaphragm test are doubtless familiar to you. In my own work I am fond of using the Maddox rod, the patient holding a tiny electric light at the reading distance, so that as soon as the infinity finding is recorded the reading distance status is simply and easily arrived at.

Then removing the rod from the trial frame and having the patient gaze steadily at the electric light it is carried closer and closer to the eyes in the median line until one or both eyes break away from the effort to fuse. In this way the convergence near point is readily determined (in only an approximate way, it is true) and much valuable information secured. Many varieties of this simple procedure have been devised.

For estimate of the prism convergence, single prisms, a battery of prisms, or the rotary prism of Jackson or Risley are needful, The Maddox prism verger is very useful for this purpose. In esophoria or exophoria the data thus obtained may throw much light on the corrective measures to be applied.

Nomenclature.

That suggested by Stevens many years ago has been pretty widely accepted, namely :—

Orthophoria.—Perfect or mathematical binocular balance.

Heterophoria.—Imperfect binocular balance. Heterophoria naturally presents many varieties, to wit :—

Esophoria.—A latent tendency of the visual axes to swing inward.

Exophoria.—A latent tendency of the visual axes to swing outward.

Hyperphoria.—A latent tendency of one visual axis to deviate above that of the other.

Hypophoria.—A latent tendency of one visual axis to deviate below that of the other.

Combinations of the above as follows :—

Hyperesophoria.—A latent tendency of one visual axis to deviate upward and inward.

Hyperexophoria.—A latent tendency of one visual axis to deviate upward and outward.

Hypoesophoria.—A latent tendency of one visual axis to deviate downward and inward.

Hypoexophoria.—A latent tendency of one visual axis to deviate downward and outward.

To these may be added :—

Anaphoria.—A latent tendency of both visual axes to deviate above the horizontal plane of the head.

Kataphoria.—A latent tendency of both visual axes to deviate below the horizontal plane of the head.

Cyclophoria.—An insufficiency or overaction of the obliques; seen principally in connection with oblique astigmatism.

While this nomenclature includes terms of both Latin and Greek derivations, it has become so general in its use that it will probably stand the test of time.

Concerning orthophoria there has come to be much liberality of view, and justly so. To regard orthophoria in the strict sense of a mathematical point is straining the matter somewhat. In this sense very few civilized persons are orthophoric. Major Field (*loc. cit.*) found but 11 % of 100 young men in perfect physical condition with mathematical orthophoria, by which is meant that the Maddox-rod-streak absolutely pierced the light in both the horizontal and vertical meridians. It is perhaps right to insist that for the vertical muscles, the streak must pass directly through the light. But when we come to consider the lateral muscles, clinical practice teaches that more latitude is not only allowable but even desirable. Our own feeling is that if a patient presents two degrees of esophoria for infinity and anywhere from balance to two degrees of exophoria for the reading distance, the said patient has a pair of eyes well adapted to prolonged use either at infinity or the reading distance so far as his ocular muscles are concerned, and he might be said to have "relative orthophoria" or "euphoria" as suggested once upon a time by Stevens, or "eukinesis" as proposed by Howe. In this sense, 78 per cent. of 100 young army recruits whom I once examined, fell in the "euphoria" class ; and this would seem to be much closer to the facts as they obtain not only in daily life but in daily practice. "Euphoria," or some better term, might well be generally accepted to define this status of the ocular muscles which clinicians the world over recognise as the one most likely to confer comfortable eyes upon their fortunate possessors.

Esophoria.

That esophoria is commonly found with hypermetropia or its allied conditions (H + Ah, Ha, H, and Ahm) all clinicians agree. The accompanying analysis of the refractive status in 100 cases of esophoria reveals 86 of the 100 as of the allied hypermetropic status and 14 of the allied myopic status, to wit :—

H	10	M	1
Ah	9	Am	7
H + Ah	66	M + Am	6
Ahm	1		
	—		—
	86		14

When esophoria is greater at the reading distance than for infinity it is likely to be the expression of some fault in the accommodation. When esophoria for infinity is associated with four or more degrees of *exophoria* at the reading distance, there is often an associated hyperphoria, manifest or latent, as a complicating feature. In the uncomplicated forms, the wearing of the proper correction will in the majority of instances care for the esophoria. But we are dealing now with the type of cases who show residual discomfort even when the correct glasses are worn. This is what might be designated *intrinsic esophoria* as contrasted with the *symptomatic esophoria* just referred to. As an instance, we cite a young woman with 18 degrees of esophoria, whose correcting glasses afforded her only partial relief. Her prism divergence was but four degrees ; her prism convergence 25 degrees at the first test. Here was plainly a case of divergence insufficiency. Exercise of the divergence faculty was begun with a pair of 2 P.D. (prism dioptre) prisms with their bases in. At first, this aggravated the patient's symptoms, but in a few days control was secured, and from that time on the prisms were gradually increased until she employed a pair of 4 P.D. prisms (total of 8 degrees), by which time the patient had arrived at comfort in the use of her eyes. Unfortunately this happy outcome has not been frequent in my work with intrinsic esophoria. A few patients have done well on prism exercises, but oftener they have not tolerated them at all. In performing this exercise the patient wears the prisms in a frame and starts with the gaze fixed on a light, one foot distant, gradually backing away from the light across the room, all the time fixing the light steadily. As they return *toward* the light the prisms are lifted to rest the eyes. This " trip " across the room may be done few or many times according to the manner in which the exercise is borne by the eyes. The practice of holding separate prisms in one or both hands is bad in that the patient's arms become tired, and the base-apex line of the prism is thus thrown off the horizontal line, introducing a vertical element which may upset the purpose of the exercise. If this exercise is well tolerated, it has value in training and sometimes extending the breadth of fusion.

One other method of exercise is to have the patient hold the head steady in the primary position, and then picking out a point straight ahead in the primary position, to turn the eyes as far to the right as possible, then return them to the primary position. Then turn the eyes as far to the left as possible and return them to the primary position. If this exercise is counted, it will be found that it is done in cycles of four, and as many cycles may be used as can be comfortably borne. Lest anyone think this is a trivial exercise, let him first try it and observe how even a few cycles will try the ocular muscles. In my hands, this simple exercise has been of great value in esophoria. I recall a young neurasthenic woman who had been most carefully refracted,* and who had worn 2 P.D. prisms, *bases out*, incorporated in her cylindrical correction for two years prior to her first visit to me. I could find no change in the refraction. Her total esophoria was eight degrees. Prism training had been a dismal failure. I finally persuaded her to try " lateral rotation " (as I have called it) and in three months she was in full and comfortable use of her eyes. Some have argued that " lateral rotation " is an exercise of an associated movement, and that it stimulates the interni as much as it does the externi. From the academic standpoint this is true ; we are training the innervation for binocular dextroduction and binocular lævoduction. We have noted in a number of instances that the faculty of binocular dextroduction (or dextroversion as some prefer to call it) is more highly developed than that of binocular lævoduction. This is a point that needs more study. Valk's insistence on the importance of dextrophoria and lævophoria is not without substantial basis.

If I have been at some pains to describe these exercise methods in detail, it is because of my conviction that unless careful attention is paid to small details in these matters, success will not crown our efforts. In general terms it may be said that esophoria of six degrees or less is amenable to a full refractive correction or even *plus* 0.50 or 0.75 sphere added for a reading correction (this has reference to those under 45). The outstanding cases that present symptoms in spite of this treatment are sometimes benefited by exercises as above indicated; but exercises of this kind are quite likely to fail in their object, and the patient should be acquainted with this fact, for then it becomes necessary to consider the *the use of prisms in the position of rest to be incorporated permanently in the patient's glasses.* This subject is by no means settled. The argument for permanent prisms has not changed in the last 25 years, nor have the arguments against them brought forth any new ideas. Twenty-two years ago Noyes observed in his text-book "It is common to find that wearing prisms a little while increases the manifest amount of muscular insufficiency. The overtasked muscles give up the struggle and lean on the prismatic glasses, hence it frequently follows that prisms are a prelude to tenotomy. My experience is strongly in favour of the helpfulness of weak prisms continually worn." This accords with my own experience, excepting his dictum as to tenotomy, in which I cannot wholly concur. Few cases of esophoria who take to permanent prisms finally come to operation unless the *surgeon* wills it so. Of course, there is the class of patients who either cannot or will not indulge in exercises for their esophoria, and for them permanent prisms become the next logical step. The argument that such prisms must be frequently added to from time to time is all too frequently upset if a sufficient number of cases is studied.

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*This barbarous-sounding word has become so generally accepted in the United States that it bids fair to become a portion of our scientific language.

For instance, J. S., aged 30 years, married, director of a gymnasium. He was in superb physical condition, but, in spite of the most careful refraction, had typical esophoria symptoms, such as panorama headache,* with gastric reflexes, photophobia, and conjunctival congestion. He had an uncomplicated esophoria of 12 degrees. He could read for a couple of hours without any ocular discomfort. Exercises were of no avail. Finally 2 P.D. prisms were incorporated in each glass for permanent use, to the almost complete relief of his symptoms. After three months, when his eyes were much rested, lateral rotation exercises were again undertaken, and this time completed the relief. This was eight years ago. Two years later the prisms were increased to three prism dioptres in each eye (a total of six) and these he has worn for six years, during which time he has won his medical degree and used his eyes outrageously. A goodly number of such histories are among my case records. In a communication on "The Value of Prisms in Ophthalmic Practice" (*Trans. Amer. Academy of Ophthalmology and Oto-Laryngology*, 1912), I analysed the findings in 906 cases in which prisms had been employed either for exercise or in the position of rest. In this whole number there were 28 cases of esophoria in which prisms were ordered for permanent use. In 24 cases the results were good, in that partial or complete relief followed their use. Four prism dioptres in each eye were the highest that were prescribed in any case, while the average was two prism diopters for each eye. It is my practice to start the usual case with about one prism dioptre in each eye. In properly selected cases, the comfort that ensues is surprising. I am careful to emphasize *properly selected cases*; by this we mean cases that have been carefully studied as to life habits, refraction, prism divergence and prism convergence, and arc rotations with the tropometer. As a rule, esophorics with divergence insufficiency (prism divergence of 4° or less and temporal arc rotations of 40° or less) are the ones most likely to accept prisms gratefully.

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*This term was coined by Dr. Bennett, of Buffalo, U.S.A., to indicate the headaches associated with or following shopping, theatre-going, and train or tram travel, attendance on a football or baseball game, or at a moving picture show.

Myopic esophoria is shown by a foregoing table to present in about 14 per cent. of all cases of esophoria. It has been claimed that excessive accommodative effort cannot be invoked to explain this variety of esophoria. I would submit, however, that few myopic esophorics are free of astigmatism and few indeed are the patients who call for a closer study of the axes of astigmatism than these myopic esophorics. What power of accommodation they have is small enough, and small astigmatic changes are sufficient to tax or even overtax what little accommodation remains to them. Moreover, it is held in many quarters that operation is the only treatment in this type of esophoria. Perhaps this is because of the conviction of many that anomalies in the insertions of the lateral muscles are more likely to be present in myopic esophoria. This is altogether likely, but it has not deterred me from resorting to permanent prisms as a means of relief, and the results have more than justified the practice. In fact, this is our present attitude toward operation in any and all types of esophoria. So much so that out of our whole series of esophorics (numbering now about 500) we have tenotomized but one.

If, therefore, it comes to a choice between permanent prisms or operation, our choice would be for the more pacific practice of wearing prisms.

Before leaving the subject of esophoria, it must be laid heavily upon the mind of the ophthalmic surgeon that it is not the patient with esophoria of 12 degrees who requires treatment of his muscular imbalance, *but* the patient with esophoria, whether of 6 or 12 degrees, who has symptoms attributable to his esophoria—who requires treatment for that condition.

(To be concluded.)

CLINICAL MEMORANDUM.

AN EXPERIMENT ON OCULAR TENSION AND INTRA-OCULAR PRESSURE*

BY
RAYNER D. BATTEN, M.D.,
LONDON, ENGLAND.

IN this experiment two pig's eyes were eviscerated through the optic nerve so that only the cornea and sclerotic were left, together with the sheath of the optic nerve. A glass canula was inserted into each eye through the optic foramen and tied in. The two eyes were connected by a Y-tube to the same mercurial manometer and to a pump, so that the pressure could be raised equally in the two eyes. In one eye there was free communication with the manometer; in the other the exit of fluid from the eye was checked by a lightly acting valve, so that very little fluid could regurgitate from the eye, whilst there was no restriction of the entrance of fluid into the eye.

The manometer pressure was therefore the same in the two eyes.

At the Oxford Congress I was enabled to test the finger tension sense of a large number of skilled observers, and the results are interesting.

The experiment was conducted in the following way:—

The pressure was brought to subnormal in both eyes. The observer was then asked to feel the tension in the eye with the valve whilst the pressure was gradually raised until he considered it to be normal. He was then asked to compare it with the tension of the other eye. This was generally found to be subnormal and the pressure was then further raised until the second eye became normal.

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*Demonstrated at the Oxford Ophthalmological Congress, July, 1914.

Most observers estimated the normal tension in the first eye, with the valve, about 20 mm., but required the pressure to be raised to 40 mm. before a normal tension was reached in the second eye. The tension in the first was then estimated at about T. +1.

There were, however, considerable variations in the estimation of normal tension amongst the observers, varying from 15 mm. to 40 mm. pressure in first eye and from 40 to 100 mm. in the second eye.

Only two observers estimated the pressure as equal in the two eyes, and even they did not stick to their first opinion.

The two eyes were similar and interchangeable, but many of the observers considered that the difference in tension was due to hardness of the sclerotic in the first eye. There was no difference in the two eyes.

Generally, those with lightest touch were the most accurate as to pressure. The pressure in the second eye was generally estimated with double the pressure of the first eye, before it reached normal.

As regard conclusions to be drawn from the experiment :—

If the finger cannot accurately estimate pressure neither can the manometer accurately estimate tension.

And whether glaucoma is caused by increased tension or increased pressure seems to be still open to discussion.

One factor at all events in the cause of tension in the freedom of exit of fluid and the amount of fluid capable of exit from an eye under pressure.

My suggestion is that in the choroidal plexus of veins we have a pool or reservoir of fluid which can be pressed out of the eye. If the quantity of blood in the plexus is very limited, or if its exit is obstructed, the eye will have increased tension, whether the pressure is above normal or not ; but if there is free exit it will require great increase in pressure to produce increased tension.

NOVELTIES.

A LANTERN FOR TESTING COLOUR PERCEPTION.

BY

T. HARRISON BUTLER, M.D.Oxon.

ASSISTANT SURGEON TO THE BIRMINGHAM AND MIDLAND EYE HOSPITAL ; AND
HON. OPHTHALMIC SURGEON TO THE COVENTRY AND LEAMINGTON GENERAL HOSPITALS.

AT some time or other every ophthalmic surgeon must feel the need of a lantern adapted for testing the colour sense, and yet he may not be disposed to expend five or six guineas upon an elaborate piece of mechanism which he may use only occasionally.

The lantern which Messrs. R. Bailey, of 14 and 15, Bennett's Hill, Birmingham, have made for me is an efficient instrument for exposing the colour blind. It is simple and it is cheap. Messrs. Bailey sell the lantern for 25s., or 30s. in a neat oak box.

The general arrangement of the lantern is shown by the illustrations. The source of light is an ordinary commercial 8-volt. carbon filament frosted lamp, which can be obtained for any usual voltage, and can be easily replaced when broken. Immediately in front of the lamp is an iris diaphragm, and in front of this again are two metal discs which carry the coloured glasses and the modifying glasses. An efficient "click" is provided which arrests the discs when any desired colour is centred before the lamp. There are four colours, and four degrees of smoked glass. One aperture in each disc is left free for the passage of the ordinary yellow lamp light. The colours are red, green, blue and purple. The blue light is obtained by the use of a carefully chosen purple and green glass placed in approximation. This mixture gives a very satisfactory blue with carbon filament illumination. The green is Board of Trade "signal green." It will be seen that the lantern is quite simple and can be managed by a non-medical examiner. It also contains no fancy combination of colours which may confuse the candidate, who is not expected to be a colour specialist. He simply has to name white, red, and green, and if he can do so when the red is modified by the smoked glasses, he is, in my opinion, fit for the Railway and the Marine Services. The blue and purple can be used to make the examination more searching.

Fig. 1.

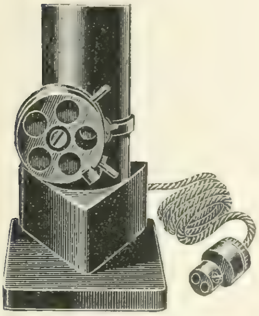


Fig. 2.

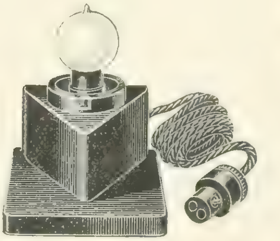
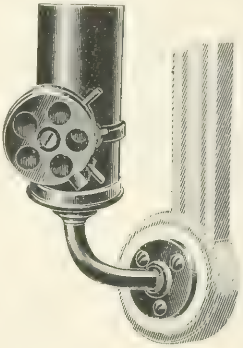


Fig. 3.



The lantern can be employed for the examination of the muscle balance with the Maddox-rod, and the iris diaphragm is useful to test for colour scotomata in cases of retrobulbar neuritis. It is here that the blue glass is especially necessary.

The lantern is superior to the Board of Trade appliance in that it possesses a range of smoked glasses which enables a candidate to be excluded who has his spectrum shortened at the red end. It is not an elaborate scientific instrument like that best of all lanterns, the Edridge-Green colour perception lamp, but it is a simple practical tool which can be understood by the laity, and I believe that for routine departmental work it will do all that is really necessary. The lantern is made either in portable form (Fig. 1) or to fix to a wall (Fig. 3).

The London agents are Messrs. John Weiss & Son, Limited.

A LENS-TESTER :

BY

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OPHTHALMIC SURGEON TO ST. GEORGE'S HOSPITAL, LONDON.

THE instrument consists of a box about eight inches long and about four inches square. One end of the box is closed except for a circular central opening one inch in diameter ; around the opening is a graduated circle, and at the ends of the vertical and horizontal meridia are cut V-sights. Sliding in the box and held in position by a spring is a ground glass screen, on which is ruled a cross. The central crossing of the arm is in the central axis of the box, and therefore corresponds with the centre of the aperture in the closed end. The rear end of the box is open.

The method of use is as follows.—The surgeon takes the lens to be tested and places it over the central opening. If the cross on the screen is seen distorted, so that not all the lines can be brought accurately into the points of the four Vs at one and the same time, there is some astigmatism of the lens and the axis of the cylindrical element can be found by rotating the lens until the angles of the cross form true right angles and the lines fall into the points of the Vs. The angular position of the cylindrical can then be read off directly from the scale.

If there be a question of proper centring or decentring to form a prism, the geometrical centre of the lens should be marked by a point of ink, and the lens placed with its centre in the horizontal meridian of the anterior opening. and rotated, if necessary, so as to bring the axis of the cylindrical into the horizontal line.

If now the horizontal line of the cross appears unbroken, the lens has no vertical prismatic effect. If, however, part of the line seen through the lens appears above or below the part seen through the empty aperture, there is a vertical prismatic deviation, and this can be measured by placing prisms of known strength over the lens until the two half lines are brought into one. It is often difficult, when the cylindrical is oblique, to calculate the prismatic effect of any decentration, and the correcting prism should be placed with its apical angle in parallel to the horizontal axis of the lens.

In this way very accurate estimation of prisms can be made. The screen is made movable, so as to allow of the examination of lenses of short focal length ; normally it is kept about five inches from the aperture.

The appliance is made by Mr Coppock, of Messrs. L. K. Leon and Co., London.

CURRENT LITERATURE.

NOTE.—Communications of which the titles only are given either contain nothing new or else do not lend themselves to abstract.

I.—ANATOMY.

Le Magourou.—The topographical anatomy of the sclero-corneal limbus. The best procedure in the performance of sclerectomy. (De l'anatomie topographique du limbe scléro-cornéen. Du meilleur procédé pour faire une sclérectomie.). *Archives d'Ophtalmologie*, février, 1914.

This article is based on a series of measurements by **Le Magourou**, taken vertically and horizontally, of the structures forming the anterior boundary of the angle of the anterior chamber, or that part which lies between the summit of the angle and the cornea proper.

The results obtained shew that there is an appreciable difference in the depth of the angle in different individuals. In those whose corneæ present a transverse appearance, owing to a marked encroachment above and below of the sclera and bulbar conjunctiva, the angle has a greater depth than in those whose corneæ present a circular appearance. The depth was found to vary from 2·5 mm. to 1·5 mm. in the upper part, and 1·750 mm. to 1·250 mm. in the lower part.

The distance between the ciliary tendon and the conjunctival limbus was greater above than below the cornea, the averages being 1·75 mm. and 1·45 respectively. There was, however, no constant relation between these two measurements. The depth of the angle in a horizontal diameter was always less than that in a vertical one, a mean of 1 mm. at both nasal and temporal ends of the horizontal diameter being found. The average measurement of the corneal bevel inserted in the sclera was 1 mm. above and ·8 mm. below.

The scleral zone, called by the author "the zone of filtration," *i.e.*, the portion of sclera between the summit of the angle and the commencement of the corneal bevel, averaged ·750 mm. above and ·650 mm. below.

The second part of Le Magourou's article is devoted to the consideration of the best operation to achieve fistulisation of the glaucomatous eye. The anatomical, experimental, and clinical evidence so far obtained, goes to show, in the author's opinion, that the ideal site for the fistula is in the scleral band, the filtration zone of which he has obtained average measurements. If the excision goes beyond this, *i.e.*, posteriorly or anteriorly, the ciliary body may be involved, on the one hand, or the cornea, on the other. It is important to avoid the former structure, for obvious reasons, whilst the proliferation which follows interference with the cornea by tending to close the fistula, makes it equally important that this also should be avoided. A trephine of 1 mm. is the only one that will give an opening within these limits; larger ones will involve either of the structures mentioned.

The opening obtained by the 1 mm. trephine is, in Le Magourou's opinion, too small. He therefore concludes in favour of the sclerectomy of Lagrange.

Six microphotographs of sectioned eyes accompany the publication, two of which show good fistulisation obtained by Lagrange's sclerectomy, and four undesirable results with the trephine. BERNARD CRIDLAND.

II.—OPHTHALMOLOGY AND GENERAL MEDICINE.

(*Fifth Notice.*)

(1) **Tibbles, Sydney G.—Two cases of ocular disease associated with pyorrhœa alveolaris.** *British Medical Journal*, April 4th, 1914.

(2) **Paton, Leslie.—Papillœdema in disseminated sclerosis.** *Trans. Ophth. Society U.K.*, Vol. XXXIV, 1914, p. 252.

(3) **Hawthorne, C. O.—Cases in which homonymous hemianopia is the principal or only evidence of organic disease.** *Trans. Ophth. Society U.K.*, Vol. XXXIV, 1914, p. 195.

(4) **Cross, F. Richardson.—Homonymous hemianopsia without other evidence of organic disease.** *Trans. Ophth. Society U.K.*, Vol. XXXIV, 1914, p. 200.

(5) **Wood, Russ.—Myasthenia gravis.** *Trans. Ophth. Society U.K.*, Vol. XXXIV, 1914, p. 267.

(1) **Tibbles,** of London, in a couple of cases of pyorrhœa alveolaris found in one, a man aged 23 years, vitreous opacities and recent choroiditis, and in the other, a woman aged 46 years, uveitis. Improvement took place under attention to the dental condition, together with local and general remedies.

SYDNEY STEPHENSON.

(2) Optic neuritis has been estimated to occur in from 0·34 per cent. (Berger) to 13 per cent. (Kampherstein) of the cases of disseminated sclerosis. Its existence under the circumstances, indeed, has been denied altogether by Risien Russell.

Paton, of London, addresses himself more particularly to papillitis with an unusual amount of swelling, which he terms "papillœdema," in insular sclerosis, since the existence of such a complication has been known to give rise to an error in the diagnosis of the underlying condition. He gives details of three such cases, and from them he draws the following conclusions.—1. The loss of sight precedes the ophthalmoscopic changes; 2. The ophthalmoscopic changes last but a short time; 3. The optic discs may show no pathological changes once the swelling has subsided; and 4. The recovery of vision is usually synchronous with the subsidence of the swelling of the disc. SYDNEY STEPHENSON.

(3) **Hawthorne,** of London, places on record nine cases of hemianopia, and divides them into two groups. The first, which includes five cases, appears to illustrate the suggestion that in patients in whom arterial rupture or obstruction is probable, such may be announced by homonymous hemianopia, either occurring alone or in association with other cerebral events. The second group includes four cases, and was composed of women, whose ages ranged from 24 to 34 years. All the women were free from evidence of cerebral, vascular, or renal disease. On the other hand, two of the patients were anæmic, and in the others the cerebral attack which gave rise to the hemianopsia occurred at seventeen years of age—that is to say, at a time of life when anæmia is more than possible, especially in girls of the hospital class. Hawthorne suggests that in this second group the hemianopsia should be regarded as an expression of intracranial sinus or venous clotting as a complication of simple anæmia or chlorosis. The same cause would be competent to explain such cerebral incidents as marked the clinical histories of the four component cases. SYDNEY STEPHENSON.

(4) **Cross,** of Clifton, Bristol, gives details of eighteen cases of homonymous hemianopsia, complete or partial. Two of the cases were of traumatic origin. Many of the others seem to bear out the points elsewhere (Bradshaw Lecture, Royal College of Surgeons of England, 1909) suggested by the author, namely: (1) that hemianopsia may occur without of necessity being an early symptom of brain mischief; (2) that a number of the patients may retain their ability of doing useful work; (3) that they may remain free from other evidence of disease for many years; and (4) that the common cause in localised cases is likely to be embolism of a twig of the calcarine artery.

SYDNEY STEPHENSON.

(5) This case of myasthenia gravis, by **Wood,** of Shrewsbury, occurred in a female, aged 38 years. Duration about one year. The left levator palpebræ superioris and internal rectus had been affected, but when the patient was

brought before the Society, there was right ptosis and paralysis of right superior, inferior, and external recti, while the lids of the left eye and its ocular movements were normal. Beyond slight weakness of the elevators of the lip on the right side, there were no other symptoms of myasthenia gravis.

SYDNEY STEPHENSON.

III.—PATHOLOGY.

(Fourth Notice.)

(1) **Verhoeff, F. H.—The effect of chronic glaucoma on the central retinal vessels.** *Archives of Ophthalmology*, March, 1913.

(2) **Stähli, J.—Contribution to the pathology of hæmorrhagic glaucoma.** *Archives of Ophthalmology*, May, 1913.

(3) **Rönne, Henning.—The pathological anatomy of glaucoma simplex. (Zur pathologischen Anatomie des Glaucoma simplex.)** *Klin. Monatsbl. f. Augenheilkunde*, Oktober-November, 1913.

(4) **Greeves, R. Affleck.—Pathological observations on the filtration angle in some glaucoma cases.** *Proceedings of the Royal Society of Medicine: Section of Ophthalmology*, June, 1914.

(1) From the investigation of thirty-nine consecutive cases of secondary glaucoma, **Verhoeff**, of Boston, U.S.A., has arrived at the following conclusions.—Secondary glaucoma always produces endovasculitis of the central vessels, leading ultimately to the complete obstruction of both; thrombosis does not occur, but dissecting aneurisms are not infrequent, and these have been mistaken for thrombosis; obstruction of the central vein seldom if ever produces the intense hæmorrhagic retinitis characteristic of primary obstruction of this vessel; by analogy, the endovasculitis of chronic primary glaucoma is the result and not the cause of the increased intra-ocular pressure, but in the majority of cases this probably does not reach a sufficiently high degree to impair vision until the latter is already lost from other causes.

ROSA FORD.

(2) **Stähli**, of Zürich, has made a pathological study of three cases of hæmorrhagic glaucoma. In all he found sclerosis of both central vein and artery, in two cases the endarteritic thickening was due to an hydropic condition of the cells of the intima, and this, he thinks, may well account for acute and especially transitory conditions of occlusion. The endothelial layer was always intact, and the absence of thromboses was thus accounted for. The retinal vessels were also sclerotic. No ruptures of vessel walls were found.

ROSA FORD.

(3) **Rönne,** of Copenhagen, obtained a *post-mortem* examination of the eyes of a patient who had been under treatment for five years on account of glaucoma simplex. Clinically, there was intra-ocular pressure of 40-45 mm. of mercury, both discs showed cupping and a glaucomatous halo, and in one eye the vision was well preserved. The tension could be satisfactorily lowered by the use of eserine. The microscope showed an open filtration angle, but there was a sclerotic change in the inner layers of the ligamentum pectinatum. There was also an anatomical peculiarity in the mode of insertion of the ciliary muscle. It looked as if all the structures forming the outer wall of

the angle of the anterior chamber had been shifted forwards, so that the ciliary muscle came to form the outer wall of the angle. An interesting question, which the author is not able to answer, is :—How did the eserine lower tension when there was no obstruction of the filtration angle by the root of the iris?

The distribution of atrophy in the optic nerves was found to correspond with the state of the fields of vision. A. J. BALLANTYNE.

(4) This well-illustrated communication, by **Greeves**, of London, is the outcome of an enquiry into a series of cases where, with raised intra-ocular tension, no adhesion of iris to cornea could be found on pathological examination of the affected eyes.

The circumstances which ordinarily give rise to such a condition, as enumerated by the author, are as follows.—(1) Disintegrating lens matter in the anterior chamber; (2) changed composition of the aqueous humour, whereby from a watery fluid it becomes converted into a highly albuminous one; (3) the detritus from an intra-ocular growth, or (?) free blood corpuscles and leucocytes, causing mechanical obstruction of the spaces of Fontana.

The specimens examined by Greeves fell into three groups.—(1) Where gross pathological changes in the framework of the filtration angle coincided with irido-cyclitis, past or present; (2) where glaucoma was recent and acute, and where the spaces of Fontana were filled with large, round, swollen, and nucleated cells, and where there was evidence of recent hæmorrhage; and (3) where rise in tension was associated with a simple detachment of the retina, but without a complicating irido-cyclitis.

As regards the first (and largest) group, in the most chronic cases the fibres of the pectinate ligament bounding the anterior chamber are incorporated into a solid mass of tissue, poor in nuclei, and often covered on its free surface by a hyaline membrane, lined by endothelium. The stroma of the iris is atrophic, and there may be a delicate vascularized membrane on the surface of the iris. The walls of Schlemm's canal, which no longer consist of a single layer of endothelium, are thickened. In the earliest stage of the process described above, the spaces of Fontana are filled with inflammatory cells, among which small capillary vessels may often be recognised. These vessels, according to Greeves, indicate that the inflammatory cells which invade the spaces of Fontana take origin from the inflamed iris and ciliary body, where they develop into scar tissue, the fibres of the pectinate ligament becoming incorporated.

As to the second group, it was found that the spaces of Fontana and the extremity of the angle were filled with swollen cells, often containing pigment granules in the cell bodies. Similar cells were also present in the stroma of the iris, as well as among the fibrils of the vitreous. Of the five cases composing this group, there was in each evidence of recent hæmorrhage into the substance of the vitreous, and of these, in two, the blood had come from a ciliary process, in one from the retinal vessels, and in two its origin could not be traced. The large cells seem to be phagocytic, and although they appear to be altered leucocytes, yet they may possibly be derived from (a) the epithelium of the ciliary body or (b) the retinal pigmented epithelium.

Greeves' third group includes two cases only of chronic glaucoma, both associated with a simple detachment of the retina. There was no sign of irido-cyclitis, nor of peripheral anterior synechia, such as was present in the cases so far reported. It is suggested, as a possible explanation of these cases, that rise in tension and retinal detachment were due to a common cause, namely, an alteration in the composition of the intra-ocular fluids.

Greeves concludes a well thought-out paper by considering the nature of the connection between an intra-ocular tumour, on the one hand, and secondary glaucoma, on the other. Admittedly, in most cases of the kind the growing tumour or a large retinal detachment displaces forward the lens and iris. But there are others, in which no such forward displacement of the structures named is found, and yet there is complete closure of the angle of the anterior chamber by the root of the iris. Now in these cases the tissues at the filtration angle show well-marked evidences of inflammation, often along with a membrane on the anterior surface of the iris and ectropion uveæ. The author suggests that possibly the inflammation is set up by some substance or substances secreted or excreted by the growing neoplasm. That the inflammatory closure may occur in glioma tells against the suggestion that the inflammatory process is secondary to obstruction of the vortex veins by the growth. The fact that corpora amylacea may be found in a number of cases of intra-ocular sarcoma, as well as in irido-cyclitis, leads Greeves to infer that new growths may produce a substance deleterious to the retina and presumably to other parts of the eye. It is possibly in the nature of a feeble toxin. SYDNEY STEPHENSON.

IV.—TRAUMATIC GLAUCOMA.

Fromaget, Camille and Fromaget, Henri.—Traumatic glaucoma. (**Le glaucome traumatique.**) *Ann. d'Oculistique*, janvier, 1913.

Camille Fromaget, of Paris, and **Henri Fromaget**, of Bordeaux, discuss traumatic glaucoma, and record two cases of the condition. As a result of an investigation of the literature of the subject, they conclude that glaucoma following non-perforative traumatisms is relatively frequent and occurs clinically either as a complication of a serious lesion, especially luxation or opacification of the lens, or as an essential condition which may develop (*a*) immediately after the injury or (*b*) after an interval, and may be accompanied by a more or less abundant hæmorrhage. The only record of a pathological examination of a human eye suffering from the condition which the authors have been able to find, is one published by Garnier, in 1891, in which, in an eye removed a fortnight after an injury which had caused glaucoma there was pronounced hyperæmia of the choroid with exudate filling the supra-choroidal spaces, but no other lesion and no trace of hæmorrhage. They contrast with this results obtained experimentally in 1907, by Canaque, who produced glaucoma in the eyes of rabbits by striking them with an india-rubber hammer, and found not only absence of hæmorrhage in the media, but integrity of the membranes without hæmorrhages or interstitial infiltration. They conclude that traumatism can cause irritation of the sympathetic producing glaucoma by hypersecretion and obstruction of the excretory passages, owing to vaso-constriction, while later generalised vaso-dilation of the eye develops owing to relaxation of the fatigued vaso-constrictor fibres aided and exaggerated by the existing hypertension. This would explain why vaso-dilation was absent from the eyes examined soon after the injury by Canaque and present in those examined at a later period by Garnier. In the first of the authors' cases a blow with the link of an iron chain was followed immediately by hyphæma, vitreous hæmorrhage, and reduced tension; but a fortnight later when the man had so far recovered that he was preparing to go back to work, glaucoma set in, which would not yield to miotics, but was cured by a scleral iridectomy. In the other case, a blow from a piece of wood on an eye caused immediate glaucoma, with reduction of vision to counting fingers and hyphæma. Under miotics, the tension became normal, and in three weeks the eye had become normal except for paresis of the sphincter of the pupil and of accommodation. The interesting point about the case is that there was transient iridodonesis on the third day with slight deepening of the anterior chamber. The authors consider that this suggests the possibility of slight injury of the zonule in some or all of the cases. R. J. COULTER.

V.—THE PROGNOSIS OF GLAUCOMA.

(1) **Lagrange, F.—The prognosis of chronic glaucoma. (Prognostic du glaucome chronique.)** *Archives d'Ophtalmologie*, juillet, 1913.

(2) **Morax and Fourrière.—The prognosis of acute glaucoma. (Le pronostic du glaucome aigu.)** *Bull. de la Société d'Ophtal. de Paris*, 3 mars, 1914.

(1) This article by **Lagrange**, of Bordeaux, on the prognosis of chronic glaucoma, is a valuable addition to the literature on this important subject, and should be read in the original. He bases his remarks on a review of 284 cases of his own which have been closely followed, and he has drawn his conclusions independently of all preconceived ideas by other authors on the subject. In his concluding remarks he says.—" The cases in which nerve degeneration exists independently of hypertension are rare, and although hypertension is not the whole of glaucoma, it is by far the greatest part of the trouble (in the proportion of 20 to 1). The prognosis of glaucoma before fistulisation of the eye is grave by reason of the progression of all the signs of the affection ; after operation, it is grave only in the neuropathics, those who suffer from local and general sclerosis, in whom, even with a normal tension, lacunæ continue to appear in the optic nerve." BERNARD CRIDLAND.

(2) This is a statistical study by **Morax** and **Fourrière**, of Paris, dealing with fifty-six cases of acute glaucoma seen at the Lariboisière Hospital during a period of nine years (January, 1904, to December, 1913.)

The figures include 9 men and 47 women, whose ages range from 40 to 90 years. The disease affected 1 eye in 23 patients, and both eyes in 32, while in 1 patient the point escaped record.

Most of the operations were performed under chloroform. When local anæsthesia was adopted, the plan was to make an orbital injection of cocaine and then to supplement it by periocular injections of novocaine. In a few instances the induction of local anæsthesia was preceded by an injection of morphine or pantopon, one hour before operation. The superiority of pantopon over morphine was not very manifest to the authors.

The operations undertaken included iridectomy with v. Graefe's knife (57), with the lance knife (16), and sclerecto-iridectomy according to Lagrange, Elliot, or Holth (12). In a few cases of excessive intra-ocular tension, a posterior sclerectomy (? sclerotomy) was practised immediately before the iridectomy. During the last few years, great care has been taken to cover the incisions with a conjunctival flap.

The complications observed to follow classic iridectomy were:—(1) hyphæma;

(2) violent pain; (3) entangled iris, preventing closure of the anterior chamber for twenty-two days; and (4) escape of vitreous, eventually necessitating removal of the eye. As to the various forms of sclerecto-iridectomy, there was no immediate complication, and the sole remote complication was the direct result of an injury to the eye.

The results obtained by the various operations may be discussed under two heads:

1. The effect upon intra-ocular tension;
2. The effect upon the functions of the eye.

1. Morax and Fourrière recognize three modes whereby tension returns after operation, as follows:—(*a*) the eye regains and retains its normal tonus; (*b*) the eye, at first soft, becomes normal, and then somewhat hypertonic (30 mm. to 35 mm. of Hg.) during a short period, the so-called *hypertension secondaire transitoire post-opératoire;* and (*c*) tonus attains and then exceeds its normal limits, despite the use of miotics. As regards (*b*) and (*c*), it may be said that (*b*), known to be common since the systematic employment of the tonometer, yields to pilocarpine, and justifies a good prognosis, while (*c*) is rebellious to remedies, and is of gloomy prognosis.

Of 26 eyes affected with acute glaucoma and treated in the classic way by v. Graefe's iridectomy, in 19 the tension became normal and in 7 remained raised. Tension in the 7 unsuccessful cases attained in 4, 38 mm. of Hg. (after 20 days, 3 months, 3 years, 9 years); in 2, 65 mm. (after 1 month and 4 months); in 1, 55 mm. after 9 years and 83 mm. after fifteen years.

Of 9 iridectomies performed with the lance knife the result was excellent in 8. In the failure tension was 72 mm. after three months.

It follows from the foregoing figures that v. Graefe's iridectomy yielded insufficient results in one-third of the cases and iridectomy made with the keratome once in nine cases.

The results in six eyes subjected to sclerecto-iridectomy were favourable, but then it must be borne in mind that certain of these cases are still relatively recent. The oldest case was that of an eye where a Lagrange operation had been done eighteen months previously, and where the tension was 25 mm. After three Holth's and one Elliot's operation, of more recent date, tension was between 18 mm. and 21 mm.

That anti-glaucomatous iridectomy does not invariably prevent an access of acute glaucoma is attested by two cases where such an event took place four months after the intervention. Details of these cases are given by the authors.

2. The authors lay it down as an axiom that the sooner an acute glaucoma is operated on the better will be the result as regards vision. This claim is amply borne out by the figures given by Morax and Fourrière. In a general way it is claimed that the prognosis of acute glaucoma, relatively good when operation is performed in the first two days, becomes doubtful when iridectomy is not performed until after the fourth day of the access. The outlook is worse for hospital than for private patients, because the former often seek advice too late. Iridectomy and even sclerecto-iridectomy, so efficacious in recent acute glaucoma, give very bad results from every point of view in absolute glaucoma

It is common to observe a rapid improvement in the extent of the visual field after the operation. A case is mentioned where a field of about 20 degrees vertically and horizontally at the time of intervention was found, three months later, to possess its normal dimensions. The improvement may be definitive. The authors have seen a field remain normal fifteen years after operation. There is another side to the shield, however, and the field may continue to become smaller, even though the tension may seem to be normal or even lower than normal after operation. Illustrative cases are quoted.

Conclusions.

The prognosis as regards operation, then, is favourable, since Morax and Fourrière had no manifest signs of infection in any of their cases, and in one alone was there escape of vitreous. As to the functional prognosis, *restitutio ad integrum* is doubtless rare, but, thanks to iridectomy, half the cases recover useful sight. The combination of sclerectomy and iridectomy allows us perhaps to obtain a longer duration for the relative efficacy of our operations. von Graefe maintained (1857) that iridectomy was capable of restoring to normal the sight of patients operated on for acute glaucoma within a fortnight of the first appearance of their symptoms. At the time he wrote his observations were based upon twenty eyes watched for a period which in no instance exceeded eight months. Morax and Fourrière give the following results in seventeen patients where more than two years had passed since operation :

Four patients operated upon nine years or more still have a visual acuity between 5/12 and 5/20, and in two of them the tension is 18 mm. in the one and 31 mm. in the other.

Five patients operated on between five and nine years ago.—In 3 sight is still adequate, but in 2 sight is poor, because the operation was undertaken too late to be of much service. Tension in 3 of the patients is between 14 mm. and 22 mm. of Hg.

Of 7 patients operated on from two to five years ago, 5 show excellent results, with tension between 14 mm. and 18 mm. of Hg., and normal vision.

SYDNEY STEPHENSON.

VI.—THE FISTULISING METHOD IN CHRONIC GLAUCOMA.

Lagrange, F.—On the fistulising method in the cure of chronic glaucoma. —Comparative value of the various operative procedures. (De la méthode fistulisante dans la cure du glaucome chronique.—Valeur comparée des divers procédés opératoires.) *Archives d'Ophtalmologie*, février, 1914.

Lagrange, of Bordeaux, deals with the subject by considering, first, the anatomical conditions which govern the operation ; secondly, the *technique* of the best procedure in making an anterior subconjunctival resection ; and, thirdly, the clinical value of sclero-corneal trephining and sclerectomy.

1.—Under the first heading he says, " It is of prime importance that the sclera alone should be concerned in the operation, for the sclera itself does not proliferate, or proliferates only to a minimal degree, especially in the aged."

Experimentally, it has been shown that the cornea proliferates actively after resection, and in further support of this statement, the author quotes a case of his own, hitherto unpublished, which certainly bears it out. The best site for the excision is one which avoids both the ciliary body and the cornea, *i.e.*, one which involves the scleral portion of the limbus only.

It is important to note that the two portions of the limbus differ in structure. In the corneo-scleral portion, the further from the summit of the angle the more important a position does the cornea occupy. The whole of the sclero-corneal segment of the filtration angle is lined on its posterior aspect by Descemet's membrane, which at the corneal circumference becomes the tendinous ring of Döllinger. Descemet's membrane is the proliferating source, and it is as important to avoid the membrane as it is to avoid the cornea itself. The conjunctiva over the scleral portion of the anterior boundary of the anterior chamber is less thin than over the sclero-corneal portion, and its wider interstitial spaces are better suited to filtration.

2.—As to the *technique* of the best procedure for an anterior sub-conjunctival resection, from the foregoing anatomical grounds it follows that a portion of sclera alone should be excised. Its breadth should be less than 1 mm., for Le Magourou, working in the Bordeaux clinique, has shown, in a recently published article,* that the average breadth of this scleral portion is 0·75 mm. The length should be from 2 mm. to 3 mm. Thus, a tongue of sclera is removed, which the author prefers to a circle, and an opening is obtained, the lips of which are surfaces which will proliferate to a minimal degree.

Of the various methods which achieve this, the author prefers his own operation or that of Holth. As regards the latter, however, it is doubted whether a keratome, which is used in this operation, can be made to cut through the ciliary tendon and so establish a communication between the choroidal space and the anterior chamber. The narrow Graefe knife used in the Lagrange operation can and does achieve this, although how often the author cannot state, for anatomical proof is wanting.

The Lagrange operation is then successful in those cases of glaucoma in which a choroidal lymphangitis exists, and has the same effect as Heine's cyclodialysis.

Those who do not believe in the possibility of cutting the ciliary tendon are recommended to adopt Holth's operation, but to use a 5 mm. by 5 mm. keratome instead of a 6 mm. by 6 mm. one.

Lagrange holds that his operation, performed with the Graefe knife, gives the most complete fistulisation of the eye, *i.e.*, of the supra-choroidal space as well as the anterior chamber, whereas when the keratome is used, fistulisation of the anterior chamber alone is obtained.

The opening by the keratome, however, is as large as that obtained by the trephine, and as it is made in the sclera, little or no proliferation is likely to follow.

3.—In comparing the clinical value of sclerectomy and sclero-corneal trephining, the author says :—" We shall be contradicted by no clinician if we say that above all we must aim at long-standing results."

" The best operation is that which gives the most lasting normalisation of the tension : it is important, then, for exact demonstration that cases of the same age should be compared, and it is deeply unjust to compare scleral trephinings some weeks old with sclerectomies of more than a year.

" We consider that it is only proper to speak of results after a year, not finite results, for clinically such hardly exist, but true successes, capable of enlightening our ideas. On the other hand, we must ask ourselves which is the procedure for fistulisation which risks the greatest number of immediate and subsequent accidents. Let us now consider the operative accidents and then the curative results :

1. " *Operative accidents.*—Sclerectomy, as I have always held, is not followed by operative accidents, 'provided that it is applied to the cases for which it was intended, *i.e.*, to chronic glaucoma, simple or compensated, with constant hypertension or with intermittent hypertension.'

" Without doubt, if it is applied to acute glaucoma or to absolute glaucoma, with a tension of +3, one may run the risk of all the dangers of iridectomy in like circumstances; but it is not the sclerectomy which is dangerous, it is the iridectomy, and in these cases that is the only operation which we advise. We reserve sclerectomy for chronic and for irritative glaucoma ; there is its field of action.

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* For abstract see p. 600 of the present number of THE OPHTHALMOSCOPE.

" It is because Meller, in the Vienna clinique, has performed sclerectomy in cases in which I have not recommended it, that he has obtained thirty-nine bad results : thirty-four in acute or absolute glaucoma, five only in another variety of glaucoma ; and I shall simply say to Meller that in these thirty-six cases of acute or absolute glaucoma he should not have performed sclerectomy. It is a wanton compromise of an operation, placing it in a bad light, both the art and the artist, prodigalising it in this manner.

" If we eliminate these thirty-four cases in which sclerectomy should not have been performed, we have only five bad results in 347 eyes. It must be agreed that the figure is a minimum. What operation exists that is not followed by five complications in 347 cases ?

" Meller in his recent work,[*] replying to an objection which I made to him in my report at the London Congress, in which I recalled to him, as here, the indications of sclerectomy, stated that whilst I published in my 104 cases of chronic glaucoma 15 failures or 13 per cent. and 15·6 failures in simple glaucoma, he had obtained only 10·7 per cent. in the first group and 8·4 per cent. in the other.

" But here, Meller involuntarily plays on the words. In bringing forward 15 failures in my 104 cases I wished to speak of visual results final after a year, and I have placed amongst the failures 8 cases in which there developed, irrespective of the operative act and a long time after it a spontaneous cataract, and also a case in which I had not operated well (too small a resection), so that there remain in all 6 failures in 104 cases, or 4 in 59 cases of chronic glaucoma (6·7 per cent.) and 2 in 45 cases of simple glaucoma (4.4 per cent.).

" The failures attributable to the operation, the operative complications, are then much less in my hands than in those of Meller, and it is not because I operate better, but because I have not performed sclerectomy in acute glaucoma and in absolute glaucoma with a very hard eye. They are equally much less for sclerectomy, according to my *technique* or analogous *techniques*, than for sclero-corneal trephining."

On this point Lagrange refers to the statistics of both Elliot and Meller.

" In 128 operations (THE OPHTHALMOSCOPE, p. 486, 1910) Elliot mentions 6 cases of vitreous loss, and in his more recent statistics (THE OPHTHALMOSCOPE, 1911, p. 567), where he analyses 66 cases followed during a certain period, but none for more than a year and a half, Elliot mentions a case of rapid glaucomatous recurrence, one of vitreous loss because the trephining was performed too far back (*trop loin*), one case of chronic irido-cyclitis, one case of loss of vision because fistulisation had ceased, and, lastly, 8 other cases where the vision progressively diminished, or in all 12 very evident failures in 66 cases without counting two spontaneous cataracts not imputable to the operation and 'the greater part of these cases have been followed less than a year.'

" Again, as far as operative accidents are concerned, let us now examine Meller's statistics. This author tells us :—' the complications, such as opacity of the lens, grave irido-cyclitis with atrophy of the globe, expulsive hæmorrhage, which unfortunately are not rare in the operation of Lagrange, are scarcely met with in Elliot's operation.'

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[*] **Meller.**—*Klin. Monatsblatter für Augenheilkunde*, Januar, 1914 ; abridged translation in THE OPHTHALMOSCOPE, April, 1914, p. 209.

"We again reply that these complications do not occur when our operation is reserved for cases of chronic or irritative glaucoma. Under these conditions we have not had a single case of traumatic cataract, a single case of expulsive hæmorrhage, a single case of irido-cyclitis. On this point it is, then, impossible that Elliot's trephining is superior to it.

"Consequently, when Meller states that the operative dangers are 8·4 per cent. in the Lagrange operation, and 2·4 per cent. in the Elliot operation, he arrives at this result only by misusing the Lagrange operation, and performing it in cases where he should not do so.

"No operation is more harmless than my sclerectomy performed in chronic glaucoma. If Meller is quite willing in the future to take into consideration the counsel I have always given under such circumstances, he will himself be quickly convinced that trephining is exposed to operative accidents, immediate and subsequent, at least as much as, perhaps more so than, my sclerectomy.

"I add that if it is desired to apply sclerectomy and trephining to chronic glaucoma, neither of these two operations is truly dangerous, and that they are both easy. To make up his mind which the clinician should prefer and choose, he has only to ask himself which is the more efficacious, *i.e.*, which gives the best, and the most lasting normalisation of the glaucomatous eye. This is what remains to be examined.

"What is the operation which gives the most lasting normalisation? Is it sclerectomy (with scissors, punch-forceps, or with the knife), or is it sclero-corneal trephining?

"Evidently we can answer this question only by an examination of the facts published, noting especially the duration of the observation. It is, in fact, only those cases followed for a long time which count. For several years past I have urged those who are following, as I am, the results of the fistulising method, to publish statistics only which are based on old cases. I have set the good example by never publishing cases of less than a year old. My colleagues will permit me to say to them that I am surprised that no one has followed me in this, for it is truly childish to say that the operation has been successful in normalising the eye, because for one or two months afterwards the organ was still at low tension. After sclerotomy and iridectomy one obtained as much, but hypertension was reproduced later, and it is on that account we have been anxious to do better.

"Consequently, to say, as Elliot has, that 118 times in 122 eyes the tension was lowered, without telling us during what length of time, or when this normalisation was noted, is really saying nothing which deserves scientific recognition on the subject of the value of the operation.

"In his second set of statistics, Elliot indeed tells us that the cases have been followed a certain time, but, once again, how long have they been followed? The greater part appear to have been during some months only.

"I reject such evidence as absolutely valueless, and I have the right, for I have published statistics of 104 cases, all of long duration:

1 case	9 years.
2 cases	8 „
2 „	7 „
8 „	6 „
3 „	5 „
17 „	4 „
17 „	3 „
27 „	2 „
27 „	1 year.

"Once again I ask my *confrères* to bring statistics comparable by their age. It is not speaking the same scientific language to place side by side, when definite results are concerned, old cases with new ones

"Meller, in the voluminous and remarkable work he has just published, has committed the same dialectic fault as Elliot."

We give this paragraph for the consideration of our readers.

"As to the return of hypertony after the two operations (sclerectomy of Lagrange, trephining of Elliot) there is a difference of 1 per cent. to the prejudice of Elliot's operation.

"But this difference should certainly be greater, for to pass an opinion on the Lagrange procedure we could have still further prolonged the observation and thus a certain number of cases would increase those of the recurrences, whilst with the short period of observation we have at our disposal for our Elliot operations, many cases which had not recurred could not be included in the statistics of recurrences after trephining."

"Does not Meller see that, since in the old cases of sclerectomy normalisation is better than in the recent cases of trephining, the question of the definitive value of the operation is established, contrary to what he has written, in favour of sclerectomy?

"Inasmuch as it is the proof of time which is everything in these circumstances, if sclerectomy after some years gives results superior to those of trephining after some months, what will happen when the work of cicatrisation on which I have insisted at length in this article has been accomplished in the corneal breach of Elliot?

"It is evident that the percentage, already favourable to my procedure of sclerectomy when one compares old cases of scleral resection with new ones of sclero-corneal trephining, will be infinitely more favourable when the comparison is made less, as it always should be, on cases of the same duration, and having reference to operations of the same date.

"I take the liberty of requesting Meller, who possesses all the necessary material, to compare 100 cases of sclerectomy of more than a year old with 100 cases of sclero-corneal trephining of the same age.

"If, as appears to me certain, as far as the return of hypertony is concerned, the difference of 1 per cent. to the prejudice of trephining is much greater, it must indeed be decided that wisely to perform the fistulising method it is important to always do so in the sclera, and consequently not to make use of the trephine. There will then be agreement between the clinical facts and those which the anatomical study of the region has indicated."

BERNARD CRIDLAND.

VII.—RETINITIS CIRCINATA.

(1) Begle, Howell L.—A clinical report of three cases of retinitis circinata. *American Journal of Ophthalmology*, September, 1912.

(2) Harman, N. Bishop.—Case of retinitis circinata; disappearance of symptoms in one year. *Transactions Ophthalmological Society U.K.*, Vol. XXXII, Fasc. 1, p. 105, 1912.

(3) Bachstez, Ernst.—A case of atypical retinitis circinata. (Ein Fall von atypischer Retinitis circinata.) *Klin. Monatsbl. f. Augenheilkunde*, August, 1913.

(4) **Harms, Clemens.**—**Atypical retinitis circinata.** (**Atypische Retinitis circinata besonderer Art.**) *Centralbl. f. prak. Augenheilkunde*, November, 1913.

(1) The three cases of retinitis circinata described (from the University Eye Clinic of Munich) by **Begle**, of Detroit, form an interesting addition to our knowledge of that rare and little understood disease. Begle gives the case incidence as, according to Fuchs, eight typical cases in 70,000 patients, and according to de Wecker as 15 in 140,000 patients.

The writer concludes :—" As regards the etiology of retinitis circinata, it is of interest to note that all three of these patients were past middle age. While definite signs of sclerosis of the retinal vessels were not observed, that circulatory disturbances were present is suggested by the presence of incipient cataracts in all the cases, a relatively high blood pressure and increased tension in the second patient, and such signs of general arteriosclerosis in the third patient as accentuation of the second sound of the heart, stiffness of the radial artery and hyaline casts in the urine. So far as I know, in only one case previously reported was retinitis circinata associated with glaucoma and that was the case described by Ammann. I can suggest no relation between an increase of tension and the retinitis circinata in the second patient other than would arise from a common origin in a diseased vascular system. The presence of yellowish areas in and about the macula, as described, instead of retinal hæmorrhages, leads me to believe that the white patches in these cases arose from fatty or other degenerative changes occurring in retinal exudates, the latter in turn arising from disease of the smaller macular vessels."

ERNEST THOMSON.

(2) **Harman**, of London, adds another to the cases of cure of retinitis circinata already on record. Treatment by potassium iodide had been adopted. The condition was limited to one eye in Harman's case.

SYDNEY STEPHENSON.

(3) **Bachstez**, of Vienna, reports and figures an interesting case.—The patient, a woman of 62 years, had suffered from failing vision in the left eye for five years. She was affected with myocarditis and general arteriosclerosis. In the right fundus there were vascular changes in the shape of tortuosity and variations of calibre of the arteries. Vision was good. In the left eye there was a large central scotoma, and vision was reduced to counting fingers in excentric portions of the field. Ophthalmoscopic examination showed, in the macular region, a grey opaque area, 1·5 disc-breadths in diameter, and at its centre a smaller yellowish patch. Above the disc and macula there was a large ring, six disc-breadths in diameter, made up of more or less confluent white spots. The lower margin of this ring touched the macular patch, and just avoided the margin of the disc. In this ring two kinds of change could be made out, and these could be most satisfactorily differentiated by Gullstrand's binocular ophthalmoscope. The first change consisted of discrete white spots, situated deeply in the retina, and the second of more solid looking opacity, situated at a more superficial level, slightly elevated, crossed by slightly veiled and altered vessels, and with one or two hæmorrhages in its neighbourhood. The white, sharply defined spots closely resembled those of retinitis circinata, but it was atypical in its situation and in its association with the more superficial retinal opacity. The macular change was also in some respects atypical.

If the case is really one of retinitis circinata, it casts doubt on the explanations which try to account for this disease on the assumption that the lesions are conditioned by the arrangement of the retinal nerve fibres or arterial twigs with relation to the macula.

A. J. BALLANTYNE.

(4) This forms a concluding paper to the already published work of Heinricq and **Harms**, of Tübingen, in the *Klinische Monatsblätter für Augenheilkunde*, the v. Graefe's *Archiv f. Ophthalmologie* and the *Heidelberg Ophth. Gessellschaft.* It deals with those cases of retinitis circinata in which the typical macula changes are absent, and gives details of several cases. In some of these cases the macula was unaffected on one side only, and the diagnosis was otherwise clear. The question is also raised whether some cases of macular affections are not really of the nature of circinata without the typical ring degeneration, and one interesting case is given in which on one side was a typical circinata and on the other merely an affection of the macula. If this can happen in one eye, obviously it can happen in both.

A. LEVY.

VIII.—GLAUCOMA.

(Miscellaneous communications.)

(1) **Vogt, A. and Jaffé, B.—Investigations regarding the alleged increase of the adrenalin content of the blood in primary glaucoma. (Einige Untersuchungen über den angeblich vermehrten Adrenalingehalt des Blutes bei Primärglaukom.)** *Klin. Monatsbl. f. Augenheilkunde*, Juli, 1912.

(2) **Lange, O.—Studies in glaucoma. (Zur Lehre vom Glaukom.)** *Klin. Monatsbl. f. Augenheilkunde*, November, 1912.

(3) **Dor, L.—Glaucomatous vertigo. (Le vertige glaucomateux.)** *La Clinique Ophtalmologique*, 10 juin, 1913.

(4) **Dunn, Percy.—The use of a mydriatic in doubtful cases of glaucoma.** *Lancet*, August 2nd, 1913.

(5) **Sulzer, E. and Ayrignac, J.—On the nutritive metabolism of glaucomatous subjects. (Des échanges nutritifs des glaucomateux.)** *Ann. d'Oculistique*, octobre, 1913.

(6) **James, Rutson.—Chronic glaucoma, associated with retinitis of a circinate type, and albuminuria.** *Trans. Oph. Society U.K.*, Vol. XXXIV, 1914, p. 315.

(7) **Griffith, A. Hill.—A case of late infection following Elliot's operation.** *British Medical Journal*, August 29th, 1914.

(1) Following up the statement of Kleczkowsk, contained in a recent article in the *Klinische Monatsblätter*, to the effect that the amount of adrenalin in the blood is increased in primary glaucoma, **Vogt** and **Jaffé**, of Aarau, investigated the blood of four cases. They found both the biological and chemical tests for adrenalin negative. A. J. BALLANTYNE.

(2) This paper by **Lange,** of Brunswick, consists of a collection of more or less connected observations on the subject of glaucoma.

Like Axenfeld and others, he has observed diminution in the depth of the glaucomatous cup after a successful operation. He has also seen it after treatment with miotics. He therefore holds to the belief that the glaucomatous excavation is the direct result of pressure. In 1887 he published a case in which he claimed that he had repeatedly noted changes in the depth of the cup corresponding to changes in the tension of the eye.

Referring next to the statement, quoted from Gilbert, that glaucoma simplex very often occurs in myopic eyes, Lange points out that in 1889 he published statistics of the refraction of 163 cases of glaucoma, of which 69 were glaucoma simplex, and that among the latter 43·3 per cent. were myopic. In the same work he gave tables showing that the congestive forms of glaucoma are more common in the female sex, and simple glaucoma in the male sex. He attributes the preponderance of females in the first group to the occurrence of climacteric disturbances in the female. In young women, as in young men, glaucoma almost always assumes the simple form.

Another observation refers to a case in which glaucoma was induced by the use of homatropine.

He next records two cases of simple glaucoma operated on by iridectomy, in one of which seventeen and a half years, and in the other eighteen years later, he found pronounced excavation of the optic nerve, with well preserved vision, good fields, and normal tension. These cases bring out the fact that we cannot predict the state of the vision from the appearance of the discs, and that the nerve-fibres can sustain, with little or no loss of function, a rise of pressure which acts over a long period of time and is gradual in its onset. Finally, he relates a case illustrating the bad effects of operating in the presence of a much contracted field of vision.

In Lange's opinion, there is no such thing as glaucoma without rise of tension, although this may not be constantly present. He opposes the use of the term "inflammatory glaucoma." In these cases, he says, there is no real inflammation present, and he suggests the substitution of the term "glaucoma hæmostaticum."

A. J. BALLANTYNE.

(3) **Dor,** of Lyons, has recently discovered a fact which he has not found mentioned in classical ophthalmic treatises, namely, that apart altogether from ordinary causes, such as gastric disturbance, labyrinthine disease, and arterio-sclerosis, there is a form of vertigo associated with rise of ocular tension and independent of vision. This vertigo, Dor says, is not a thing that the patient himself complains of, any more than he complains spontaneously that he has hard eyes. It must be asked about, since the patient does not associate the vertigo with the visual defect. The vertigo may be so severe that the patient cannot go out of doors alone. The author relates four cases, in all of which the vertigo disappeared when the tension had been reduced by operation. Of these four cases, three had complete monocular blindness, and the fourth such a serious defect of the field that she was almost blind of one eye. Dor concludes that "decompressive" operations may be worth doing on blind eyes, otherwise not worth operating upon, for the sake of relief from this vertigo.

ERNEST THOMSON.

(4) **Dunn,** of London, in a letter to the Editor of the *Lancet*, refers to the review in that journal of the recently published text-book on "Diseases and Injuries of the Eye," by W. G. Sym. He takes exception to the opinion of the reviewer that homatropine should be used for this purpose, and states that cocain is the safest mydriatic under these circumstances. The dilatation, says Dunn, is more rapid than with any other similar alkaloid, and although not of maximal degree, is ample for the purpose. Miosis, if necessary, can be induced by eserine within half an hour after the instillation of cocain. This is more than can be said for homatropine, which has been proved dangerous

by the recorded cases of acute glaucoma supervening after its routine use, even in the hand of the expert.

It may be well to note that the original writer, W. G. Sym, entirely condemns the use of any mydriatic for the purpose of assisting in the diagnosis of doubtful cases. ERNEST THOMSON.

(5) **E. Sulzer** and **J. Ayrignac,** of Paris, have made an exhaustive examination of the urine in a number of cases of primary glaucoma, secondary glaucoma, and optic atrophy simulating glaucoma, with a view to discovering whether any disorders of metabolism are associated with these conditions.

The results of their investigations may be summarised as follows.—1. Primary glaucoma is always associated with hepatic insufficiency, relative renal impermeability, and diminution in the destruction of albumin, and is frequently accompanied by intestinal troubles and mineral instability. 2. These abnormalities are absent from secondary glaucoma and from optic atrophy. 3. The relief of these abnormalities by appropriate dieting, etc., may render complete and permanent the reduction of tension obtained by miotics or operative measures. These abnormalities constitute a variety of arthritism to which an ocular predisposition must be added in order to produce glaucoma. The tension of the eyes of a number of patients with urinary abnormalities similar to those found in glaucoma, but no subjective or objective visual defects, was examined with the Schiötz tonometer, and cases were found in which it differed in the two eyes of the same patient, or varied considerably from time to time, but became and remained constantly normal when the disorder of metabolism was remedied.

The authors conclude that it is of capital importance to seek for and to remedy disorders of metabolism in patients suffering from glaucoma, but that this treatment must be combined with operative measures which it cannot replace. R. J. COULTER.

(6) **R. James**, of London, found associated in one eye of a female, aged 68 years, chronic glaucoma and a form of retinitis with a circinate arrangement, so as to form an almost complete ring around the macula. V. = less than 6/60. There was albumin in the urine. SYDNEY STEPHENSON.

(7) In March, 1912, **Griffith**, of Manchester, performed Elliot's operation upon both eyes of a man, aged 55 years, on account of chronic glaucoma of five years' duration. Perfect recovery. Patient discharged within a month. On March 11th last, however, he was re-admitted with purulent irido-cyclitis of the left eye, a condition that had been present for four days. It was necessary to excise the affected eye.

Discussion.

H. Gifford, of Omaha, U.S.A., had seen an eye lost from late infection after an apparently faultless trephining. He had heard of two cases of sympathetic ophthalmitis following trephining. Every patient who showed a bleb after Elliot's operation should use systematically a weak zinc wash, or something similar, daily to the eye. The infection was exogenous, and the danger was in direct proportion to the prominence of the bleb.

Devereux Marshall, of London, recalled the case of a lady who was operated on for chronic glaucoma in 1887, with good results, but with cystoid scars. A year later, conjunctival catarrh developed, and one eye was entirely lost from irido-cyclitis.

Montagu Harston, of Hong Kong, considered it important before operating to exclude, as far as possible, any latent sinus affection.

A. J. Ballantyne, of Glasgow, agreed that cases presenting a prominent thin-walled cystic scar were those most liable to late infection.

Herbert Parsons, of London, was surprised that late infection did not occur more frequently. A large flap was essential, and the trephine wound should be made far forward in the cornea, as Elliot insisted.

Casey A. Wood, of Chicago, had seen two cases of late infection, which commenced at the margin of the flap.

James A. Wilson, of Glasgow, thought that the conjunctival flap should be cut as thick as possible.

Maitland Ramsay, of Glasgow, believed that the ends of the flap should not be cut down to the corneal margin. SYDNEY STEPHENSON.

IX.—INJURIES OF THE EYE.

1.—Chemical Agents.

(1) Fehr.—Lens opacities after hydrochloric acid injuries. (Linsentrübung nach Salzsäure-Verätzung.) *Centralbl. f. prak. Augenheilkunde*, April, 1911.

(2) Roche.—Violent projection of tar into the eyes. (Violent projection de goudron dans les yeux.—Simple observation.) *Ann. d'Oculistique*, novembre, 1911.

(3) Hempel, E.—Corrosion of the cornea by lysol and permanganate of potash. (Ueber Verätzung der Hornhaut durch Lysol und Kali permanganicum.) *Klin. Monatsbl. f. Augenheilkunde*, Dezember, 1911.

(4) Koerber, H.—On a case of cauterization of the eye with potassium hydrate. (Ueber einen Fall von Laugenverätzung des Auges.) *Zeitschrift für Augenheilkunde*, März, 1912.

(5) Igersheimer, J. — Injury to the eyes by chrysarobin. (Ueber Schädigung der Augen durch Chrysarobin.) *Klin. Monatsbl. f. Augenheilkunde*, Mai, 1912.

(6) Wood, Casey A.—Burns of the eyeball from the contents of so-called "water-core" golf balls. *Ophthalmic Record*, October, 1912.

(7) Fisher, W. A.—Atrophy of the optic nerve, following injection of olive oil and lanoline for the removal of wrinkles. *Ophthalmic Record*, January, 1913.

(8) Fernandez, Juan Santos.—Eye troubles caused by the use of hair dyes. *Archives of Ophthalmology*, January, 1913.

(9) Fernandez.—The effect of hair dyes on the eyes. (Las perturbaciones de los ojos, por teñirse el cabello.) *Arch. de Oftal.*, March, 1913.

(10) Brown, S. H.—Accidental tattooing of the cornea by a piece of lead from a copying pencil. *Ophthalmology*, April, 1913.

(11) Bernstein, Edward J.—Sudden total blindness following iodine or a fracture. *Ophthalmology*, October, 1913.

(12) **Pascheff.—Violet eye caused by chemical pencils. (L'œil violet des crayons chimiques.)** *Ann. d'Oculistique*, juin, 1914.

(13) **Jessop, Walter H. H.—Case of severe injury to an eye from the contents of a golf ball.** *Lancet*, July 18th, 1914.

(1) In connection with a case of injury with hydrochloric acid, **Fehr**, of Berlin, refers to the original experimental work of Guillery, who found that corneal injuries produced by the inorganic acids, such as hydrochloric, nitric, or sulphuric acids, were often complicated by opacities of the lens. These were not produced by acetic acid, or brine or alkalis. These opacities develop in a few hours after the application of the acid to the cornea, and affect chiefly the capsule and anterior cortex. If the quantity of applied acid be large, the equatorial portions are affected and also the posterior layers of the lens. Schmidt recorded a case in man in which such a development of cataract occurred, but the ætiological connection was not absolutely certain.

Fehr's case is definite on this point.—The patient, a man, *æt.* 47 years, had a large quantity of pure hydrochloric acid poured over his face as an act of revenge. Several hours after, the eyes were washed out, and twenty hours after the application of the caustic, he was brought to the eye clinic. The whole face was extensively corroded—the conjunctivæ were changed into dense greyish-white membranes with necrotic bits. The corneæ were less affected; there was diffuse cloudiness of substance, but the iris and pupil could be recognised. Both pupils were active, and both *lenses were densely opaque*. During the following days, large conjunctival sloughs became separated, but the corneæ cleared up in a remarkable manner. Eight days after the accident, the first signs of necrosis occurred. The eyes become soft, deep yellow infiltrations formed at the corneal margin and spread rapidly over the whole surface, and soon the corneæ gave way and both eyeballs became shrunken, and owing to the extensive destruction of the lids, there resulted total symblepharon and ankyloblepharon. The final result was brought about not by the severe corneal injury, but by the destruction of the nutritive vessels of the eyeballs. The original injury to the corneæ was comparatively slight, but the lenses suffered much more, and it may be assumed that the extremely diffusible hydrochloric acid entered not only through the corneæ but also through the sclera and thus attacked the lenses from all sides, leading to the rapid development of complete cataract. A. LEVY.

(2) **Roche** records the case of a workman who got some Norway tar projected so violently against his face that he was thrown down and rendered almost unconscious. When seen six hours later, he had extreme photophobia. After cocainisation, his eyes were opened, when the conjunctivæ were found much reddened, with some traces of tar in the lower culs-de-sac, but the corneæ were extremely black, owing to being covered with a thin layer of tar which stopped exactly at the limbus on each eye, but did not leave the least trace of the corneæ uncovered. The pellicles of tar were removed with a cataract curette, leaving the corneæ normal except for slight dulness. Next day the conjunctivæ were red and the corneæ normal, and the patient complained of photophobia and headache. These symptoms persisted for rather a long time, but at the end of a month, the man was able to resume his work, perfectly cured.

The author points out that owing to the variable composition of the different kinds of tar, the results of injuries with other varieties might be more serious than those in his case. R. J. COULTER.

(3) In the first of the two cases recorded by **Hempel**, of Strassburg, a man who was syringing a horse's wound with a solution of lysol (supposed

to be 2½%), got some in his own eye. Although washed out with water, the eye became severely inflamed, and vision was clouded. When examined, there was redness and swelling of the palpebral conjunctiva, ciliary injection, and total opacity of the cornea. Vision was 3/35. Two months later, there was still slight ciliary injection, the periphery of the cornea was clear and superficially vascularised, and vision was 4/60. The corneal opacity was permanent. In experiments on rabbits, guinea pigs, and monkeys, 2½% lysol produced irritation and corneal erosions, but healing took place in three days and left no permanent opacity. The author suggests that the patient may have got the material in stronger concentration than was thought.

In the second case 1% potassium permanganate lotion and ½% silver nitrate drops had been prescribed for an infant with mucopurulent conjunctivitis. By mistake, the parents had used the undiluted solution of permanganate. Both corneæ became grey and opaque, with a striate brown opacity in each. In a few days there was purulent infiltration of both corneæ, and the ultimate result was total leucoma.

It is said that the injurious effects of this salt are due to the potash liberated when it comes in contact with organic matter. If a few drops of acetic acid be previously added to the solution, this effect is avoided. A. J. BALLANTYNE.

(4) **Koerber,** of Hamborn-Marxloh, reports a case of a man who got a splash of caustic potash into his eye. At first, the only symptoms were those of a slight conjunctival burn, but after a day or two, severe iridocyclitis, with hypopyon, set in. Koerber, remembering a case of ammonia burn described by Pickler (*Zeitschrift für Augenheilkunde*, April, 1910, Bd. XXIII, Heft 4), performed paracentesis, and after prolonged treatment, the eye recovered.

T. HARRISON BUTLER.

(5) It has been known for years that the application of chrysarobin, even when it has not been applied to the head, may lead to the occurrence of conjunctivitis, characterised (according to Trousseau) by photophobia, lacrymation, and blepharospasm, of sudden onset, usually bilateral, without secretion, and with intact cornea.

Igersheimer, of Halle, having been struck by the intensity of the photophobia, in contrast with the apparent mildness of the conjunctivitis, undertook a systematic examination of the cornea in these cases, using the corneal microscope, after dilatation of the pupil. He invariably found corneal involvement, which took the form of a superficial punctate keratitis. This may recover in a few days, or it may persist in a modified form, visible to the corneal microscope, for weeks. The iris is not involved. The dimness of vision in these cases is largely due to the corneal condition, and improves as this clears up.

As regards the route by which the drug reaches the eye, there are three possibilities, *viz.*: (1) that the drug is conveyed to the eye direct, by the hand or other means; (2) that it finds its way by intercutaneous channels from a neighbouring site of application; (3) that it is absorbed into the circulation and secreted in the tears. The *pros* and *cons* of these different methods are considered, and while there is sufficient evidence that all three may occur, the author is of opinion that further observations are required on the point.

Details of eleven cases are given. A. J. BALLANTYNE.

(6) **Wood,** of Chicago, reports an accident which befell a man who cut into a "water-core" golf ball, "in order to see how it was made." The liquid core, being under pressure of the rubber ribbons, squirted out when released and got into his left eye and over his face, which were burnt by the thickish corrosive fluid. Conjunctival and ciliary injection and a whitish

eschar involving two-thirds of the cornea and reduction of vision to counting fingers followed, but eventually the inflammation and opacity disappeared, and vision returned to 6/12.

The writer found, on enquiry, that his case was by no means an isolated instance of such an accident. J. JAMESON EVANS.

(7) **Fisher**, of Chicago, reports a case of acute retrobulbar neuritis, followed by atrophy of the disc, which resulted from the subcutaneous injection, between the eyes, of equal parts of olive oil and lanoline. Two injections were made, but the first one gave rise to no reaction, whilst the second was followed by marked reaction and swelling about the eyes, and five days later, the vision of the left eye failed and blindness of that eye has been complete since.

J. JAMESON EVANS.

(8) **Fernandez** finds from an extensive experience, that although the practice of using hair dyes is general, the proportion of eye troubles resulting therefrom is very small. Nevertheless, he concludes that all hair dyes are more or less toxic in effect. He divides the dyes into four classes : (1) decolorising (H_2O_2), (2) vegetable tinctures, (3) tinctures with metallic basis, *e.g.*, caustic potash, nitrates of silver and mercury, bismuth, acetates of lead and copper, nitric and sulphuric acids, and sodium hyposulphite ; (4) aniline dyes. The last-named do the most harm, and as they are very easily prepared, they are the most generally used ; since only a small quantity of the dye is required, however, to produce the result desired, there is so much the less danger to the eyes and health. The injurious effects experienced are of two classes, inflammatory and toxic. Of the former are vesicle formation on the scalp, leading to the formation of crusts and the falling out of the hair in tufts and œdema spreading to the eyelids and face. The toxic symptoms may be due to absorption through the unbroken skin, as in the use of dyes containing lead, sulphur, or mercury, or to absorption from the inflammatory vesicles first produced, as in the use of pyrogallic acid, silver nitrate, and phenylendiamine. The toxic symptoms include headache, vertigo, dyspnœa, arrhythmia, vomiting, sleeplessness, albuminuria, and retrobulbar neuritis. The ocular symptoms may be the only ones. ROSA FORD.

(9) Almost all the dyes in common use are to some extent toxic, and may affect the eyes. By **Fernandez** they are divided into four groups :—1. deodorant (peroxide of hydrogen) ; 2. vegetable dyes, these are rarely used ; 3. metallic dyes, these are the old-fashioned dyes, and contain caustic potash, nitrate of silver or mercury, bismuth, acetate of copper or lead ; 4. aniline dyes, which are at present the most general.

Although accidents are rare, given the large number of people who use dyes, yet they are sufficiently common and serious enough to justify notice. Thus, central scotomata have been seen, and a retrobulbar neuritis may be diagnosed which is really due to intoxication. HAROLD GRIMSDALE.

(10) **Brown**, of Philadelphia, describes a case in which injury with a copying ink pencil caused an abrasion leading to an ulcer of the cornea. Four days later, the discolouration was gone, and the ulcer healed rapidly.

He refers also to the case of two school girls who placed shavings from an aniline pencil in their conjunctival sacs and produced a grotesque violet coloration of the whole conjunctiva. These cases also confirmed the general experience that the staining from aniline pencil injuries is not permanent.

A. J. BALLANTYNE.

(11) A woman sustained a Colles's fracture, and a week later teno-synovitis set in. Her doctor painted the parts with ten per cent. solution of iodine. Four days later, there was general œdema and herpes of the arm and side of the face, which subsided in about four days. A few days later, she awoke

during the night to find that she was totally blind. Four weeks after the injury she was seen by **Bernstein**, of Kalamazoo, Michigan. Light perception was abolished, there was total bilateral paralysis of the levatores and superior recti, pupils were two millimetres in diameter, the fundi were extremely pale, the arteries mere threads, the veins engorged, and the retina was a little hazy but without any "cherry-red" spot.

The author raises the question whether the condition could be attributed to iodine poisoning, or whether it could be due to arterial obstruction from embolism, which would bring it into line with cases of death from embolism following fracture.

A month later, the fundus was normal, but vision was no more than light perception, and there was some mental clouding, loss of memory, and hesitancy in speech. A. J. BALLANTYNE.

(12) **Pascheff**, of Sofia, records two cases of sudden violet coloration of the conjunctiva which rapidly disappeared under treatment with simple bathing. The patients were both school children who worked much with "chemical" pencils, but neither of them could remember having been touched or struck with a pencil. The author found that a similar transitory coloration of the conjunctiva could be produced in animals with the copying pencils in common use in his neighbourhood. R. J. COULTER.

(13) **Jessop**, of London, does well to record this case in a journal of general medicine and surgery. Not every one is aware that golf balls may be as dangerous as ammunition to those of an enquiring turn of mind.

In the case here described, when the core of the ball was pierced, a semi-fluid caustic substance was ejected with great force. Some of this entered the unfortunate enquirer's right eye, and seriously damaged the cornea and conjunctiva. After healing had taken place, in about a month, the cornea remained hazy and the V.A. was only 6/60.

In an editorial in the same number of the *Lancet*, there is an account of the method of manufacture of such balls. The semi-fluid contents are composed of soft soap, very strongly alkaline. The little bag of rubber which contains the soap, the neck of which is tied with string, is, in the process of manufacture, tightly compressed by means of rubber binding. If this rubber binding be carefully unwound, the bag in the centre gradually expands to its natural size, and no harm can happen; but if it be pierced when under pressure, as in the case here recorded, a veritable "explosion" may take place. ERNEST THOMSON.

2.—Light or Electricity.

(1) v. Marenholtz.—A contribution to injuries of the eye by lightning. (Ein Beitrag zu den Blitzschädigungen des Auges.) *Zeitschrift für Augenheilkunde*, Oktober, 1912.

(2) Knapp, Paul.—Bilateral macular disease following a short circuit. (Beidseitige Makulaerkrankung nach Kurzschluss.) *Zeitschrift für Augenheilkunde*, Mai, 1913.

(3) Culbertson, L. R.—Case of cataract resulting from lightning stroke. *American Journal of Ophthalmology*, September, 1913.

(4) Lauder, Edward.—Industrial electricity as a cause of cataract. *Ophthalmology*, January, 1914.

(5) **Manzutto (Trieste).—Visual disturbances due to the action of a high tension current. (Disturbi visivi dovuti all'azione della corrente elettrica ad alta tensione.)** *La Clinica Oculistica*, April, 1914.

(1) **Freiherr v. Marenholtz**, of Nuremberg, describes the case of a man who was struck by lightning and rendered unconscious. He recovered, without paralyses, in half an hour. The hair and eyebrow on the right side were singed, but no other injuries were noted. Six weeks later, he was examined, and it was found that R.V. = 6/60, L.V. = 6/6. There was photophobia, pericorneal injection, and iris synechiæ on the right side. There were punctate opacities in the anterior lens capsule. The nerve-head was cloudy and fluffy. In the macular region was a grey patch with a white edge, and on the nasal side of the disc was a large, curved, atrophic pigmented area. Absolute scotomata corresponded to these areas. The field of vision was concentrically contracted, especially for red. Treatment with atropine cured the iritis, but the sight did not improve.

The author thinks that the retinal defects were due to the catalytic or electrolytic action of the electric current. T. HARRISON BUTLER.

(2) **Knapp,** of Basle, describes a case in which an electrician in an aluminium smelting works was exposed to the flash of a short circuit, a flash estimated at 150,000 candle power, as the circuit carried a very heavy current. After the ophthalmia electrica had passed off, the patient complained of metamorphopsia and of a positive scotoma. Knapp found a macular retino-choroiditis at each posterior pole which had a half-moon shape with the curvature downwards. The workman saw only half the flash, the other half being shielded from his eyes by a metal plate. The macular disease was a kind of optogram of the instantaneous flame which fell upon the retina. The appearance noted at the fundus is shown by a coloured plate. T. HARRISON BUTLER.

(3) **Culbertson,** of Zanesville, Ohio, reports the interesting case of a lady, age 21 years, who was in the act of telephoning to her doctor when the telephone wires were struck by lightning. She was knocked down and rendered unconscious. When first seen by Culbertson, seven weeks later, she was suffering from irido-cyclitis. The patient returned about seven months afterwards blind from soft cataract in the left eye, and nearly blind in the right eye from the same cause. At the time of writing, Culbertson had completed, quite successfully, a cataract operation on the left eye.

ERNEST THOMSON.

(4) **Lauder,** of Cleveland, Ohio, reports the following case.—The patient, a man of 22 years, after a soaking, took shelter in a building beside two transformers used for reducing a direct current of 22,000 volts to one of 1,000 volts. Suddenly he received a shock which rendered him unconscious, and he fell backward on to the wires connecting the two transformers. He was found with a burn of the third degree on the left buttock, a burn of the eyelids, and singeing of the eyelashes and eyebrows. Three months later, he had inflammation of the conjunctivæ, and fourteen months after the accident, opacities were detected in the lenses. The opacities were chiefly of the dust-like variety, and were situated immediately beneath the anterior capsule. During the succeeding eight months, the opacities showed a tendency to increase. A. J. BALLANTYNE.

(5) A workman, repairing a live wire, received the current (500 volts). He became insensible, and on recovery, found that he was unable to perceive anything but a sensation of light, usually of a bright yellow colour. There were considerable burns of the face. The left eye recovered rapidly, but the right

did not; the bright dazzling light was replaced by almost total darkness, so that with this eye, the patient could perceive only very large objects dimly through a dense mist. Within a few hours of the accident, there appeared the usual symptoms of electric ophthalmia, but with more pain in the head than is usual in these cases.
H. GRIMSDALE.

X.—OPERATIONS.

28.—Cataract.

(1) **Fisher, W. A.—The intracapsular cataract operation in immature cataract.** *Ophthalmology*, April, 1914.

(2) **Guillermo, Sanchez Aguilera.—On preventive and curative treatment of hernia of the iris in cataract operation. (Tratamiento preventivo y curativo de las hernias de iris en la operacion de cataratas.)** *Archiv de Oftal. Hisp.-Amer.*, Mayo, 1914.

(3) **Pascheff.—Cataract extraction combined with peripheral iridotomy. (L'extraction de la cataracte combinée à l'iridotomie périphérique.)** *Ann. d'Oculistique*, juin, 1914.

(4) **Fergus, Freeland.—Essential points in cataract operations.** *Ophthalmic Review*, September, 1914.

(1) **Fisher,** of Chicago, who has studied the intracapsular operation under Smith, at Amritsar, shows himself a whole-hearted advocate of the method. His discussion of the value and advantages of intracapsular extraction, especially in the case of immature cataract, follows familiar lines, but he has introduced certain modifications in the *technique*. Two assistants are employed, one to elevate the upper lid and depress the lower, the other to control the eyebrow. In place of Smith's hook for elevating the upper lid, he has introduced a double instrument, one end of which is a lid elevator, used while the incision is being made, the other end a *double* hook which is said to be superior to the single one for gaining control of the upper lid. He also describes a pair of capsule forceps specially adapted for the position of the eye in this operation. His advice to those who would do the operation is that they should in the first place continue to do the capsulotomy operation, using the Smith *technique* as regards lid elevation, etc., and that they should practise the use of the Smith spoon on pigs' eyes, before attempting the Smith operation on the human subject.

The reading of this paper was followed by a discussion which was taken part in by some who, like D. T. Vail, had had the advantage of similar training in the performance of the operation. Opinions, of course, differed as to the attitude which should be adopted by American and European surgeons. With considerable unanimity speakers condemned the use of the speculum in cataract work and expressed approval of Fisher's double hook.
A. J. BALLANTYNE.

(2) In a case in which cataract extraction was followed by hernia of the iris, **Aguilera,** of Grenada, was unable to perform iridectomy on account of fear of loss of vitreous, and contented himself with instilling one or two drops of eserine and bandaging the eye. Within a few days he found the iris

completely reduced; since then he has used the method of prolonged bandaging, with instillation of eserine, in a number of cases, and has found this almost always successful. H. GRIMSDALE.

(3) **Pascheff,** of Sofia, does a small peripheral iridotomy as part of the operation for senile cataract. He makes the cut in the iris *in situ* with a pair of modified de Wecker's scissors, which he introduces into the anterior chamber immediately after making the corneal section, and claims that it tends to prevent prolapse of the iris without interfering with the round shape of the pupil. R. J. COULTER.

(4) The scientific keynote of this racy and reminiscent article by **Fergus,** of Glasgow, is sepsis, which he holds to be the sole cause of post-operative inflammation. As determining such a complication he attaches no importance to the pattern or construction of the instruments employed. Cortical remains after cataract extraction are believed to exert no influence. The operation of cataract, in his view, does not require any careful preparation of the patient, as by preliminary treatment with vaccines or sera. On the other hand, it does require careful examination and preparation of the eye. "Test dressings" are utterly contemned. As long ago as 1891, Fergus claims to have discovered how to avoid suppuration after operation. In that year he began the practice of having every eye that was to be operated on examined with regard to its conjunctival secretion by a competent bacteriologist. Since that date, now 23 years ago, Fergus has never seen panophthalmitis after operation in his work, although he admits that "one or two have gone astray with irido-cyclitis, but not many." If any pathogenic micro-organisms, particularly the *streptococcus*, *pneumococcus*, and *S.p. aureus*, are found in the conjunctival sac, operation is postponed. If an abundant growth be obtained of those common germs the *S.p. albus* and *B. xerosis*, operation is again postponed. Moreover, Fergus thinking, as he is now inclined to do, that under certain conditions the two organisms just named may be the cause of post-operative iritis, purposes in the future not to operate as long as they can be found in the cultures. In order to rid the conjunctival sac of organisms, Fergus freely irrigates twice a day with a pint or more of sterilised normal saline. He draws the inference that if an operation be absolutely sterile, a tough after-cataract will never result.

SYDNEY STEPHENSON.

29.—Glaucoma.

(1) **Fox, L. Webster.—The newer operations for acute and chronic glaucoma.** *Pennsylvania Medical Journal*, January, 1914, and *Ophthalmology*, January, 1914.

(2) **Remmen, Nils.—Report of twenty cases of trephining for glaucoma.** *Ophthalmology*, January, 1914.

(3) **Axenfeld, Th.—Remarks on the London discussion on the newer operations for glaucoma. (Bemerkungen zu der Londoner Diskussion über die neueren Glaukomoperationen.)** *Klin. Monatsbl. f. Augenheilkunde*, September, 1913.

(4) **Constantinesco, I.—Late infection after trephining for glaucoma. (L'infection tardive après la trépanation antiglaucomateuse.)** *La Clinique Ophtalmologique*, 10 décembre, 1913.

(5) **Knapp, Arnold.**—Some results after trephining. *Archives of Ophthalmology*, No. 2, 1914.

(6) **Elliot, R. H.**—The experiences of surgeons in sclero-corneal trephining. *British Medical Journal*, April 25th, 1914.

(7) **Sulzer, D. E.**—On the results of the operative treatment of glaucoma from its institution to the present day. (Les résultats du traitement opératoire du glaucome de son institution à nos jours.) *Ann. d'Oculistique*, juin, 1914.

(8) **Walker, A. Nimmo.**—Further experiences of sclero-corneal trephining for glaucoma. *Liverpool Medico-Chirurgical Journal*, July, 1914.

(9) **McNab, Angus.**—Lecture on the recent advances in the treatment of glaucoma. *Polyclinic*, July, 1914.

(10) **James, G. Brooksbank.**—Irido-sclerotomy in glaucoma. *Trans. Ophth. Society U.K.*, Vol. XXXIV, 1914, p. 303.

(1) The title of this article by **Fox**, of Philadelphia, exactly describes its contents. He discusses turn by turn iridectomy, sclerotomy, Herbert's "wedge isolation" operation, cyclodialysis, Lagrange's operation, Bettremieux's non-perforating sclerectomy, and Elliot's operation. None of the procedures named has given Fox greater satisfaction than the Elliot trephining, in the performance of which he has made certain modifications. For example, he has applied the van Lint sliding flap, has employed sutures, and uses a modified von Hippel trephine. Finally, he briefly describes the T sclerotomy recently devised by van Lint, of Brussels.

SYDNEY STEPHENSON.

(2) The paper by **Remmen**, of Chicago, presents nothing new. In most of the cases trephining was done for the relief of pain and tension in eyes blind from glaucoma.

A. J. BALLANTYNE.

(3) **Axenfeld**, of Freiburg i. B., in this paper sums up the main points of the discussion which took place at the recent International Congress in London.

He says that both Elliot and Lagrange aim at the establishment of permanent filtration or fistulisation of the scar, and discussion has chiefly centred in the question as to which of the operations is the better calculated to fulfil this condition. Both authors lay great emphasis on the production of a "cushion," but if we take this as the criterion of success, our cases will show many failures. Axenfeld, however, thinks it is unfair to limit the claim of success to those cases which show permanent subconjunctival filtration. There are many possible explanations of favourable results apart from this, and, although both Lagrange and Elliot consider that iridectomy is not a necessary part of their operations, Axenfeld thinks it possible that the iridectomy may play a part in the success of some cases; and, since iridectomy is almost always done, it is impossible to exclude its influence from the result. He personally advises that iridectomy should be done in all cases, for in cases where a filtering scar is not obtained the operation may be looked upon simply as an iridectomy through a modified incision, and it is to be noted that, even for the deliberate performance of an iridectomy, the trephine presents several advantages, such as ease of manipulation, the certainty of reaching the angle of the anterior chamber, and the gradual escape of the aqueous.

Elliot has referred to one or two occurrences which indicate the moment at which the trephine has perforated the sclera or cornea, and Axenfeld adds another which he believes to be new, namely, that at the moment when perforation occurs, there is a slight movement of the pupil towards the wound.

While the author agrees that there are cases of glaucoma which cannot be saved without trephining, he holds that where a good result can be obtained without fistulisation the latter should be avoided. To this class belong the cases of acute inflammatory glaucoma, and cases even of chronic glaucoma benefit in many cases from iridectomy or the use of drugs. He would advise iridectomy in the first place, and if repeated examination of the visual acuity, the fields, and the tension, indicates a good result, one may be content without sclerectomy.

One of the most serious dangers of these operations is late infection, and he thinks that this is the greatest in cases with a thin-walled transparent cushion and good filtration. He therefore advises the dissection of a thick "episcleral" flap to cover the wound. A. J. BALLANTYNE.

(4) **Constantinesco**, of Bucharest, having suffered the disappointment of a late infection after trephining, makes enquiry into this risk. A number of cases have already been reported, and the principal questions are: firstly, should the operation be abandoned on account of this risk; secondly, how can it be prevented and infection treated when it occurs. The answer to the first question is, that trephining is such a useful operation that it cannot be given up on account of the risk of late infection. As to the second point, Axenfeld has suggested that the flap of conjunctiva should embrace as much subconjunctival tissue as possible. Again, the further forward the opening is made, the less is the risk of an infection becoming disastrous, since the infection can be more easily dealt with than when the vitreous is involved. In the author's opinion, after infection has taken place, the conjunctiva should be "advanced," and the trephine orifice cauterised—that is, the conjunctiva is to be dissected up from around the trephine hole, the latter cauterised, and then a conjunctival flap stitched over it, the stitches being left for eight days.

With regard to the source of infection, the author holds that there is always an ulceration of the conjunctiva by which the organisms gain entrance, that while these organisms may come from dust or foreign bodies lodging on the eye, or from the roots of the hair follicles, the most fruitful source of them is the nose. ERNEST THOMSON.

(5) This communication by **Arnold Knapp**, of New York, is based upon twenty operations of trephining for glaucoma, following the principles laid down by R. H. Elliot. A 2mm. trephine was used, for if the aperture was too small, it was found difficult to divide the attachment of the scleral disc cleanly and to get out the iris. Knapp soon observed that to ensure filtration, the button-hole iridectomy should be large. The after-complications included detachment of the choroid, iritis, hypotony, and late infection. Knapp regards the complication of hypotony as a serious one, a remark that applies with equal force to late infections.

Trephining possesses, to Knapp's mind, two outstanding advantages:—(1) its safety as compared with other operations for reducing tension in hard eyes; (2) its certainty in obtaining a cystoid cicatrix. At the same time, in view of its complications, Knapp thinks that we should not abandon iridectomy in acute glaucoma, nor for that matter in early glaucoma, provided it is marked by prodromal attacks alone. Indeed, the sole indication for trephining is to be found in cases of chronic glaucoma, or in cases seen in the congestive attacks during the course of a chronic glaucoma.

SYDNEY STEPHENSON.

(6) **Elliot**, of London, devotes the present article to extracts from the work, published and unpublished, of surgeons all over the world, with a view to showing how they regard his operation of sclero-corneal trephining.
SYDNEY STEPHENSON.

(7) **Sulzer,** of Paris, concludes from a critical examination of the available statistics that the present operative treatment of glaucoma not only gives results which equal those obtained by von Graefe and his immediate successors, but has made definite progress in regulating the tension and probable progress in preserving the functions of the optic nerve. He considers that this progress is due to the operators, who have striven to produce permanent fistulisation.
R. J. COULTER.

(8) **Walker**, of Liverpool, briefly sketches the evolution undergone by sclero-corneal trephining, which he regards as by far the most satisfactory form of surgical treatment yet discovered, both for acute and chronic forms of glaucoma. Personally, he now endeavours to facilitate prolapse of iris during operation by instructing the patient to close his mouth and to squeeze gently. As soon as the bead of iris presents, it is incised, when, provided it be not dragged upon, it falls back into the anterior chamber. Walker still employs the modified von Hippel trephine, described in THE OPHTHALMOSCOPE of 1911, p. 797, provided with a "bit" of 1·5 mm. diameter. The author surmises that the very forward position of the trephine hole, as now practised, may have one disadvantage, namely, that the corneal segment of the conjunctival flap may heal firmly over the aperture, and thereby prevent filtration taking place through the latter. He recommends massage of the eye as soon as the anterior chamber is restored.
SYDNEY STEPHENSON.

(9) **McNab**, of London, discusses some of the newer operations for glaucoma, and expresses the opinion that both Herbert's "small flap operation" and Elliot's trephining appear to be thoroughly efficient. In his view, then, the position is vastly better than it was only some five years ago.
SYDNEY STEPHENSON.

(10) **B. James**, of London, describes anew an operation he has practised for some three and a half years for the relief of glaucoma. Essentially, he endeavours to produce a filtering scar by incising the anterior chamber, from without in, after cutting a large conjunctival flap, everting a portion of Descemet's membrane, and keeping the latter in position by replacing, but not suturing the conjunctival flap. James professes himself as very satisfied with the results of the operation given in baldest outline above. In between 200 and 300 cases he has almost always succeeded in producing a filtering scar.
SYDNEY STEPHENSON.

XI.—REMEDIES.

(Ninth Notice.)

(1) Weekers, M. L.—Experimental researches on the thermotherapy of progressive ulcers of the cornea. (Recherches expérimentales sur la thermothérapie des ulcères progressifs de la cornée.) *Bull. de la Société Belge d'Ophtalmologie*, août, 1913.

(2) Allport, Frank and Rochester, Alexander.—Cacodylate of sodium in a case of kerato-iritis due to lime burn. *Ophthalmic Record*, September, 1913.

(3) Matsukawa, J.—A case of gumma of the ciliary body and optic nerve following injection of salvarsan. (Ueber einen Fall von Ziliar- und Sehnervengumma nach Salvarsaninjektion.) *Klin. Monatsbl. f. Augenheilkunde*, Dezember, 1913.

(4) Siegrist, A.—Salvarsan in the treatment of sympathetic ophthalmia. (Salvarsan gegen die sympathische Augenentzündung.) *Klin. Monatsbl. f. Augenheilkunde*, Dezember, 1913.

(5) Thienpont.—Dionine contra-indicated in glaucoma. (La dionine contre-indiquée dans le glaucome.) *Bulletin de la Société Belge d'Ophtalmologie*, avril, 1914.

(6) Schanz, Fritz.—The basis of light treatment for diseases of the eye. *Ophthalmology*, April, 1914.

(7) Thienpont.—Dionin contra-indicated in glaucoma. (La dionine contre-indiquée dans le glaucome.) *Bulletin de la Société Belge d'Ophtalmologie*, 26 mai, 1914.

(8) van Duyse.—The prophylaxis of trachoma. (La prophylaxie du trachome et le projet de loi sanitaire.) *Société Belge d'Ophtalmologie*, 26 mai, 1914.

(9) Kaz, R.—Eserine ointment in the large infiltrations of scrofulous keratitis. (La pommade à l'ésérine dans les vastes infiltrations de la Kératite scrofuleuse.) *La Clinique Ophtalmologique*, 10 juin, 1914.

(10) Bourdeaux.—The treatment of extreme degrees of myopia. (Le traitement des myopies extrèmes.) *La Clinique Ophtalmologique*, 10 juin, 1914.

(11) Puscariu, Elena.—The treatment of blennorrhœal conjunctivitis with ethylhydrocupreine. (Le traitement de la conjontivite blennorrhagique par l'éthylhydrocupréine.) *La Clinique Ophtalmologique*, 10 juin, 1914.

(12) Roche, Charles.—The serum of Nicolle and Blaizot in the gonococcal conjunctivitis of the new-born. (La sérum de Nicolle et Blaizot dans la conjontivite gonococcique des nouveau-nés.) *La Clinique Ophtalmologique*, 10 juin, 1914.

(1) **M. L. Weekers**, of Liége, uses the platinum loop of a galvano-cautery at such a degree of medium incandescence that when the cautery is held for a minute against the mercury bulb of a thermometer, without touching it, the temperature does not rise above 50°. After anæsthesia, the cautery loop is carried lightly over the entire surface of the cornea, as near as possible without touching it. This application lasts one minute, and makes the surface of the ulcer dry. This process is repeated two or three times for one minute on each occasion, closing the eye for a few seconds before each application, so as to moisten the ulcer. Usually, three such applications at one sitting are sufficient, but very rarely on the next day or the next day but one, the treatment may have to be repeated. Weekers claims immediate amelioration of symptoms, much less risk of perforation, and lessened density of the subsequent nebula. He gives statistics to prove this, and also describes sections from the cornea of rabbits (1) after cauterising, (2) after applying heat by his method, taken at different periods after operation. H. HAWARD BYWATER.

(2) **Allport** and **Rochester**, of Chicago, are so impressed with the favourable

result of this treatment (in addition to ordinary remedies) that they are constrained to report a solitary case. When first seen, the cornea was completely opaque, and the patient had symptoms of acute iritis. He was treated with antiseptic eyewashes, atropine drops, and hot fomentations, and powdered dionin for about a month, without any evident effect on the corneal opacity. After this, he was given an intramuscular injection of 7 grains of cacodylate of sodium, and two or three days later, the cornea began to clear. A week later, the injection was repeated in a 3½ grain dose, and this was repeated every two or three days—seven injections in all being adminstered. In about five weeks, the whole cornea became completely transparent, with vision of 20/20, with correction.
J. JAMESON EVANS.

(3) The eye lesions which have already been observed as sequelæ of salvarsan injection are: optic neuritis, irido-cyclitis, paralysis of ocular muscles, chorio-retinitis, scleritis, and keratitis. There has also been published one case of gumma of the iris and one of gumma of the optic nerve.

The case here reported by **Matsukawa**, of Tokio, was that of a man, 32 years of age, who developed iritis nine months after syphilitic infection. It resisted treatment, and he was given 0·6 gramme salvarsan, followed by potassium iodide and mercury. Four months later, a growth appeared in the lower-outer ciliary region. The eye was excised on account of continued pain, and was found to present gummatous infiltration of the optic nerve, especially at the nerve-head, and a large gumma of the ciliary body breaking through at the corneo-scleral junction. Pathological changes were also present in iris, choroid, and vitreous.

In this case the period of onset of the gummatous affection after the salvarsan injection was similar to that in most of the reported cases, but the time which had elapsed since the primary infection was unusually long, namely, eighteen months, contrasting with three to six months, which is the period in the majority of cases.
A. J. BALLANTYNE.

(4) **Siegrist**, of Bern, in 1910 reported a case of sympathetic ophthalmia successfully treated with salvarsan. In the present paper he adds a second case, and refers briefly to another case communicated to him by a colleague.
A. J. BALLANTYNE.

(5) **Thienpont**, of St. Nicholas, has observed an attack of acute glaucoma after the instillation of dionine in a patient who presented the prodromal phenomena of glaucoma and whose other eye had already been affected with acute glaucoma. The author, furthermore, had measured the ocular tension in several cases after dionine had been applied to the eye. In eight cases the tension rose from 3 mm. to 9 mm. of mercury, while in two it fell from 6 mm. to 8 mm. of mercury. The hypertension, which was independent of any variation in the diameter of the pupil, lasted for at least fifteen minutes.
MARCEL DANIS.

(6) **Schanz**, of Dresden, opens his paper with a description of experiments made to ascertain the absoptive power of such tissues as the cornea and lens, the importance of such studies arising from the fact that tissues are only affected by the rays which they absorb, not by those which are transparent. The spectrograph shows that the human cornea absorbs a great many of the rays of short wave length, *i.e.*, in the ultraviolet. Hence, such rays exercise a stimulant effect upon the cornea, and if their action, in ordinary intensities, is continued for unduly long periods, or if they are allowed to act for short periods, but in greater intensity, pathological states are the result. Thus, prolonged exposure under ordinary conditions to light which is rich in the ultraviolet rays may give rise to fatigue, heat, itching,

watering, and redness of the eyes, while more intense action of similar light leads to such well known affections as light catarrh and electric ophthalmia.

In a mixed light the rays which reach the lens comprise some of short wave length which have escaped the filtering effect of the cornea. Those which the lens absorbs, if in abnormal intensity or acting over long periods, have an injurious effect on the lens and its epithelium analogous to that of the sunlight on the skin. Briefly, Schanz believes that senile cataract is the result of prolonged action of the solar rays of short wave length, and a somewhat similar mechanism accounts for the origin of glassblowers' cataract.

Some of the rays of short wave length which reach the lens excite fluorescence therein, as was interestingly demonstrated by Schanz at the International Congress of Medicine in London last autumn. Other rays pass on to the retina and excite fluorescence in it. This fluorescence of lens and retina can be seen to have a very disturbing effect on vision under certain circumstances. To it Schanz attributes the difficulty experienced by marksmen in shooting at a target when the eye is exposed to light from a clear blue sky. In shooting, it has been empirically found that benefit is derived from glasses of certain colours, and the author states that these will be found to be glasses which absorb the ultraviolet rays.

A point of some practical importance is the discovery of Axenfeld and others that ultraviolet rays reduce the dark adaptation of the retina, and that retinitis pigmentosa, and other conditions associated with night blindness, are benefited by the use of glasses which absorb these rays. A good illustration of the value of filtering off the rays of short wave lengths under certain circumstances, was afforded by the experience of Amundsen in his South Polar journey. He and one companion who wore "Euphos" glasses were the only members of the party who did not suffer from snow blindness. Somewhat similar experiences have been reported by aviators, mountaineers, and sailors. Generally speaking, Schanz is of the opinion that those whose eyes are exposed for long periods to light rich in the rays which act upon the cornea, conjunctiva, and lens, or which excite the fluorescence of the retina, will do well to filter these short length rays from the light. The value of "Euphos" glass is that it effectually stops these rays without causing an appreciable reduction of the visible rays.

Since the rays in question have, within limits, a stimulating instead of a destructive or irritant effect, would it not be possible to utilise this stimulating action as a therapeutic agent in certain cases? By passing mixed light through uviol glasses and other suitable filters, it is possible to reduce the visible rays while allowing the rays of short wave length to pass, and this can be so adjusted as to give passage to rays which will be entirely absorbed by the cornea and leave the lens unaffected. It is suggested that the use of such glasses in the sunlight might be beneficial in some cases of corneal inflammation.

A. J. BALLANTYNE.

(7) **Thienpont,** of St.-Nicholas, mentions that dionin causes a preliminary state of increase before diminution of tension, and that this may provoke an attack of acute glaucoma. After relating a case in which a subacute glaucoma became acute shortly after dionin instillation, he states the results of experiments on twelve eyes having different forms of disease, having observed the variation in the size of the pupil and the evolution of the chemosis in relation to the tension as measured by Schiötz's tonometer. He considers that (1) the effect of dionin on the eye commences directly after application, with a definite increase of tension; (2) this increase of tension lasts at least fifteen minutes; (3) it is independent of the variation in the size of the pupil, and (4) the effect of dionin on the size of the pupil varies. Thienpont considers

the œdema of the ocular conjunctiva a defensive phenomenon of the organism against the absorption of the dionin and a mechanical obstacle to the vascular depletion of the entire anterior part of the eye, causing congestion here, especially of the ciliary body. This passive hyperæmia of the ciliary body is, according to Weber, the cause of glaucoma. To support this, Thienpont mentions that definite and constant increase of tension follows subconjunctival injections, which are therefore contra-indicated in glaucoma, and he concludes that dionin is absolutely contra-indicated in every case of increased tension. H. HAWARD BYWATER

(8) **van Duyse**, of Ghent, explains that the object of the proposed Belgian sanitary law is to lay down measures of prophylaxis applicable to a certain number of maladies. He demands that trachoma, which is endemic in the Flemish provinces of Belgium, should be included among these diseases. He suggests that the Belgian Ophthalmological Society should adopt a series of desiderata for transmission to the sanitary authorities. MARCEL DANIS.

(9) **Kaz**, of Petrograd, insists on the use of eserine in severe scrofulous keratitis with blepharospasm. The usual treatment is by means of atropine, which makes matters worse. Eserine acts in the most miraculous manner in these cases. Two cases are related, and references are given to the author's previous communications on this subject. The author's theory is, that when the eyes are closed, and the head buried in a pillow, the pupils are widely dilated, and inflammatory products are unable to get away. When the pupils are contracted by eserine, the drainage surface of the iris is increased, and the iridic crypts are enlarged, while the angle of the anterior chamber is also opened out. ERNEST THOMSON.

(10) **Bourdeaux**, of Amiens, deals with his experience of high myopia in an interesting and not too lengthened a manner. He relates two or three cases which he has treated successfully, and merely refers to the fact that he has treated a good many others. Contrary to the opinion of some ophthalmologists, he believes in a very full correction. He estimates the total carefully, under atropine, and gives a correction which brings the *punctum remotum* beyond one metre. The glasses are worn constantly. Secondly (again he is in opposition to some oculists) he keeps the eye permanently under atropine. Thirdly, he believes in the pressure bandage, to be used whenever possible and for as long as possible. Fourthly, hypertonic subconjunctival injections. To these measures may be added as accessories, leeching, pediluvia, careful attention to the bowels, and change of air.

The following is the composition of the injection which the author employs :

Chloride of Sodium	2 grammes
Dionine	0·30 gramme
Hydrochloride of cocaine	0·05 gramme
Sterilised distilled water	10 grammes

A little less than 1 c.c. is to be injected. ERNEST THOMSON.

(11) Ethylhydrocupreine, or "optochine," is a derivative of quinine, obtained by Morgenroth and his collaborators Halbertstaedter and Levy. The experimental work of Morgenroth and the clinical researches of Goldschmidt, Schur, and Darier, have shown that this product has a great power of destroying the pneumococcus.

Puscariu, of Bucharest, has employed this agent in gonococcal conjunctivitis with excellent effect. In an acute and recent case, where a girl in attendance on an infant with blennorrhœa had become infected, the instillation thrice daily of ethylhydrocupreine, 2 per cent., preceded by thorough flushing out of the conjunctiva, resulted in complete cure in a few days. In cases where the inflammation has been going on for a longer time (four to seven days), a 1 per cent. solution is used every hour. The treatment must be continued for a week or two before the organisms completely disappear. Lastly, in cases of a retrogressive type, but where the organisms persist, it has been found that these disappear after three days of treatment.

The treatment by means of ethylhydrocupreine has the great advantage of being almost painless, and simple of application. ERNEST THOMSON.

(12) On October 6th, 1913, Nicolle and Blaizot, at the Académie des Sciences, presented a vaccine for the cure of all gonococcal affections. This vaccine contains a mixture of nine parts of synococci to one part of gonococci. According to Nicolle and Blaizot, "synococci" are organisms very closely allied to the gonococci, and always associated therewith. Their most important characteristic is that they take up Gram. With this vaccine, Cuénod and Penel, of Tunis, treated twenty-six cases of gonococcal conjunctivitis, and came to the conclusion that it was a sure remedy in this affection. Offret, after treating thirty-two cases, reached a similar conclusion.

Roche, of Marseilles, has used the vaccine in four cases of ophthalmia of the new-born of gonococcal origin. The results were extraordinarily good. The vaccine is harmless. The three-fourths of a cubic centimeter injected have not given the slightest reaction or caused the least inconvenience. Its efficacy is incontrovertible. According to Roche, this vaccine is as efficacious in blennorrhœa as the serum of Roux is in diphtheria.

Readers of THE OPHTHALMOSCOPE may be interested to have the original references, namely :

Nicolle et Blaizot.—*Académie des Sciences*, 6 octobre, 1913.
Cuénod et Penel.—*Annales d'Oculistique*, novembre, 1913.
Offret, A.—*Ibid.*, février, 1914.
Morax, A.—*Société d'Obstétrique*, 9 février, 1914.

ERNEST THOMSON.

XII.—MISCELLANEOUS.

(1) Coulomb, R.—On the word "borgne." (A propos du mot "Borgne.") *Ann. d'Oculistique*, août, 1912.

(2) v. Szily, A.—Experimental tumours in embryos and their significance in the genesis of gliomata. (Experimentelle Tumoren bei Embryonen und ihre Bedeutung für die Gliomgenese.) *Bericht der Ophthalmologischen Gesellschaft*, Heidelberg, 1912.

(3) Reitsch, W.—The determination of position in the fundus. (Zur Lagebestimmung im Augenhintergrund.) *Klin. Monatsbl. f. Augenheilkunde*, Januar, 1913.

(4) Carlo, E.—A study of the photo-electric properties of selenium for moderate luminous intensities. A possible application to clinical photometry. (Etude des propriétés photo-électriques du sélénium pour des intensités lumineuses moyennes. Application possible à la photométrie clinique.) *Ann. d'Oculistique*, septembre, 1913.

(5) Curtil.—A note on the writing of the blind. (Note sur l'écriture des aveugles.) *Revue Générale d'Ophtalmologie*, 30 septembre, 1913.

(6) **Folinea.**—**The antitryptic power of the serum in affections of the orbit. (Il potere antitriptico del siero di sangue nelle offezioni dell'orbita.)** *Arch. di Ottalmolog.*, Gennaio, 1914.

(1) **Coulomb**, of Paris, suggests that the word "heterophthalmia" should be used in French instead of "borgne" to denote a person who has only one eye, and quotes classical authorities in support of the term. Some similar word would be useful in English. R. J. COULTER.

(2) **v. Szily**, of Tübingen, has succeeded by various methods in so influencing the development of hen's eggs that gliomata formed in the embryonic brain. He showed the sections of these tumours to the Congress and traced their development. The results confirm the views of Cohnheim and Ribbert, namely, that tumours are due to included germinal cells which have taken on an abnormal luxuriant growth.

The original abstract should be consulted and the drawings studied.

T. HARRISON BUTLER.

(3) If a patient is seated at the perimeter as if for the measurement of the field of vision, and if the eye which is in position is examined by indirect ophthalmoscopy, it is possible for the observer to define the position of any lesion in the fundus by the use of the arc of the perimeter. Two figures giving the meridian of the lesion and its distance from the fixation point will sufficiently indicate the position which it occupies in the fundus. There are, however, a number of sources of error when this simple method is used.

Reitsch has designed an instrument on the lines of the perimeter, but modified in certain particulars in such a way as to increase the accuracy of the measurements. His paper is an interesting one, but, as the author himself admits, the apparatus has a very limited sphere of usefulness.

A. J. BALLANTYNE.

(4) The element selenium has the property of changing its electrical conductivity according to the illumination to which it is exposed, and **Carlo**, of le Havre, has endeavoured to find out whether this peculiarity can be utilised in clinical photometry, and if so, under what conditions. His experiments showed that exposure of a film of selenium to white light, both with and without previous exposure to sunlight, caused irregular movements of an ampèremeter, but that with monochromatic light and a previous exposure of selenium to light the galvanometric deviations corresponding to moderate illuminations remained almost comparable if the exposure of the selenium to the light to be measured did not exceed ten seconds. He has mapped out curves showing the amount of galvanometric deviation for various luminous intensities, and considers that it is possible within the limits of his experiments to measure the luminous intensities or degrees of illumination of monochromatic radiation objectively at a given point, and from the results so obtained to calculate the intensity of the total white light emitted by the same source, so that there ought to be no difficulty in constructing a clinical photometer. R. J. COULTER.

(5) **Curtil**, of Lyons, grumbles at the inconveniences and well-known drawbacks of Braille type, but has absolutely nothing new to suggest.

(6) It is well known, says **Folinea**, of Naples, that in certain cachectic conditions, the blood serum has its normal power of inhibiting the action of trypsin much increased, and this not so much in relation to the degree of cachexia as to the nature thereof. The reaction becomes of considerable importance in the diagnosis of the early stages of malignant tumour. Folinea has examined the reaction in certain cases of orbital swelling of doubtful nature

and has been much helped in coming to a conclusion. In one case in which everything seemed to point against the possibility of a syphilitic origin of the swelling—even the Wassermann reaction was negative—the low antitryptic reaction of the serum encouraged the author to hope that the swelling was not malignant, and, in fact, a course of mercury brought about a cure.

HAROLD GRIMSDALE.

CORRESPONDENCE.

[While THE OPHTHALMOSCOPE will at all times welcome correspondence from its readers, the Editor does not hold himself responsible for any views expressed in this column.]

AN IMPROVEMENT IN LOCAL ANÆSTHESIA IN OPERATIONS UPON THE EYE.

To the Editor of THE OPHTHALMOSCOPE.

DEAR SIR,

Of all the valuable papers at the recent very successful Oxford Ophthalmological Congress, towards the happy results of which you so largely contributed as to be able to say with an old Latin writer, *cujus fui magna pars*, that which particularly appealed to me was the excellent one by Mr. G. H. Pooley on "An Improvement in Local Anæsthesia in Operations upon the Eye."

As the author states, "necessity is said to be the mother of invention," and it was owing to necessity that I began several years ago to excise the eye by the aid of local anæsthesia.

For, although I have practised as an ophthalmic surgeon in the Eastern Counties' Capital for upwards of a quarter of a century, amongst all sorts and conditions of patients, I have never been blessed—or otherwise—with a hospital appointment, and have often been hard put to it when operating upon the very poor.

In my early days here I tramped from house to house, and did cataract, iridectomy, squint, excision, and other operations often under great difficulties with regard to light, table, antiseptic arrangements, etc.

This gradually led to my undertaking these operations in my own consulting room, and I have now for many years done practically all my operations on the poor in this way and with most satisfactory results; the eye being securely protected by pad, bandage, plaster, etc., takes no harm, even if the patient has to walk or tram a mile or more home.

But only during the last few years have I excised the eye under local anæsthesia, and I can well remember the first occasion of doing so. The patient, broken down in health, with a miserable home and a wife blind of both eyes, had a blind, very inflamed, acutely sensitive, and extremely painful glaucomatous eye, unrelieved by an iridectomy I had tried. Something more radical had to be done. Wondering what would happen, I thought I would attempt its removal under local anæsthesia, and with an ordinary hypodermic syringe, I injected a solution of novocain with supra renin borate deep into the orbit, aiming at the region of the optic nerve, first above and then below the eye and through the skin of the upper and lower lids.

Some cocaine had been dropped into the conjunctival sac and a little also injected subconjunctivally, and some thirty to forty minutes later, I began to enucleate in fear and trembling, quite expecting the operation would prove so painful that I should have to desist in the middle thereof, but instead, to my great delight, no pain was felt, and the operation was most satisfactorily completed ; a compress and bandage were applied, and the patient walked home.

The success of this case led me to practise this method in others with some modifications, and I now, having anæsthetised the conjunctival sac with cocaine, inject the novocaine, etc., solution through the conjunctiva—not through the skin of the lids—laterally, *i.e.*, along the inner and outer rectus muscles, the object being, of course, to anæsthetise the ciliary nerves emerging from the posterior pole of the eye.

This procedure is quite well established now, especially on the Continent, but it was altogether original then, so far as I am concerned, as I had never seen, heard, or read of that method having been attempted before ; still it is a dangerous thing to claim priority for anything—someone always seems to have done something exactly similar twenty years or more ago and to have given it up since—and there appears to be nothing new under the sun.

In the interval between my first excision under local anaesthesia and the present time, I have naturally been tempted to adopt this method in other ophthalmic operations, iridectomy, etc., etc., for the greater includes the less, but, although "greatly daring," I have never dared this.

Primum non nocere has loomed large before my eyes, and I have always feared some permanent damage might possibly be done by the needle to the optic or ciliary nerves or vessels, etc., *e.g.*, to a cilio-retinal artery or the lenticular ganglion or other structures, which would be of no consequence in case of an excision, and I have held my hand : when injecting deeply into the orbit one does not know exactly where the point of the needle is or what it is doing, but up to the present, Mr. Pooley does not appear to have met with any untoward results, and I congratulate him on his courage and acumen in breaking new ground, which I had only thought of doing, whereas he has gone one better and done it.

Yours very faithfully,
S. JOHNSON TAYLOR.

NORWICH.
Aug. 20th, 1914.

THE DIPLOMA IN OPHTHALMOLOGY (OXFORD).

To the Editor of THE OPHTHALMOSCOPE.

SIR,

As the above subject is once more under discussion in the columns of THE OPHTHALMOSCOPE, and as I am engaged in teaching ophthalmology at our most junior University in the Empire, I do not think your readers will take it amiss if I venture to set forth my views on the subject. I am the more qualified to do so from the fact that I have recently been through the course, and also from the fact that I have been in active ophthalmic practice for the last ten years.

In the first place, I must emphasize the fact that the whole course only lasts some ten weeks, and therefore in no sense does it claim to cover a candidate's ophthalmological education from A to Z. The standard set at the examination for the diploma is a high one. If evidence is needed of this, I would call attention to the fact that approximately 50 per cent. of the candidates at the recent examination in July were rejected. It is essential that a prospective candidate should already possess an intimate knowledge of the subject, not a mere book knowledge, but a *practical* knowledge, before he enters for the course. The majority of the candidates who were recently rejected possessed, in my opinion, an excellent theoretical knowledge; concerning one of them, a London ophthalmologist of the highest standing wrote to me: "I considered that he knew his work well, certainly well enough to pass." Now that very candidate possessed no practical experience, and, personally, I was by no means surprised at his rejection.

The above premises will serve to dissipate some of the nebulous vapour which has obscured the nature of the Diploma Examination, judging by some of the criticisms I have heard passed upon it.

Let us assume that the candidate enters the course for the Diploma with a good practical knowledge of his subject. He then embellishes his knowledge by that obtained from the special course of lectures given at Oxford for the purpose of obtaining the Diploma, just in the same manner that a practitioner home from the tropics enhances his knowledge at the London School of Tropical Medicine before taking his M.D.(Lond.) in that subject, or before taking the Diploma of Tropical Medicine at that school.

The course of lectures and demonstrations given at Oxford for the purposes of the Diploma includes the following:—a special course of lectures by the Reader in Ophthalmology; a special course of lectures by ophthalmologists from various parts of the country, each one of whom lectures on a subject to which he has devoted special attention; a course of lectures and demonstrations on the histology and pathology of the eye; a most valuable course of lectures on medical ophthalmology by Dr. A. G Gibson; a special practical course on the bacteriology of the eye; courses on geometrical and physiological optics; and last, but by no means least, a most excellent course on the anatomy of the eye by Professor Arthur Thomson and Mr. S. E. Whitnall, illustrated by a series of superb dissections and stereoscopic photographs.

It will be admitted that the above is no mean list to subserve its purpose of embellishing knowledge already possessed I wish, however, to make, with all due deference, an important suggestion to the authorities of the University of Oxford. Interesting as the course of lectures set out for the Diploma of the University undoubtedly is, the present scope of the diploma is altogether too narrow. I take it that the main purpose of the generous donor of the funds for a Readership in Ophthalmology was the advancement of the science of ophthalmology. Now a specialist's Degree in Ophthalmology is badly needed to eliminate the self-styled specialists who are met with the world over. The scope of the present regulations for the D.O.(Oxon.) is too restricted.

Granted that a special degree is needed, let us utilise one already in existence. The University of Oxford would lay the whole Empire under a debt of obligation if it opened its Diploma to all ophthalmologists throughout the Empire, and not, as under present regulations, restrict its Diploma to those ophthalmologists who are able to spare the time to put in residence at Oxford, which the present regulations entail. Let those special courses of lectures be given at any recognised ophthalmic hospital under the auspices of the University, in the same way that instruction is recognised at the various hospitals by the University of London.

The only comment I have to make upon the above suggestion is a practical financial one: if the University can see its way to enlarge the scope of its Diploma in the way I have suggested, there will necessarily follow a large influx of examination fees into the coffers of the Oxford University. If such, or similar advice, is not followed, then sooner or later a special Degree will be instituted in London and elsewhere, and Oxford, from the paucity of clinical material, will be left in the lurch. The academic atmosphere of Oxford is such that one could only look upon the latter event as a calamity. I earnestly appeal therefore to the University of Oxford to give the same recognition to the science of ophthalmology which it has in later years given to other sciences, and to render the position of its diplomates in ophthalmology such that they will receive universal recognition.

Yours truly,

G. MONTAGU HARSTON, M.D.(Lond.), D.O.(Oxon.)
Lecturer in Ophthalmology, Hong Kong University;
Ophthalmic Surgeon, Tung Wa Hospital, Hong Kong.

BOOK NOTICES.

Transactions of the Ophthalmological Society of the United Kingdom. Volume XXXIV. Session 1914. London: J. and A. Churchill, 7, Great Marlborough Street. Price, 12s. 6d.

The present volume comprises the proceedings of the Ophthalmological Society during its thirty-fourth session, held in London, April 23rd to 25th last.

Boletin de la Sociedad de Oftalmologia de Buenos Aires. "Las Ciéncias." GUIDI BUFFARINI, Cordoba, Buenos Aires. 1914.

A new ophthalmological society has been formed in Buenos Aires, and we have received the first number of its *Transactions*, dated January, 1914. It is a well printed book of fifty-three pages, containing several articles of interest. The president of the Society, Dr. Lagleyze, contributes two articles: one on a parasitic infection of the eyelids, and the other on a case of leontiasis ossea; another valuable contribution is from Drs. Noceti and Houssayon, a case of pituitary tumour, without acromegaly, but showing marked ocular symptoms. Both this case and the first-mentioned are well illustrated by reproductions of radiographs. H. GRIMSDALE.

Transactions of the American Ophthalmological Society. Vol. XIII, Part iii, 1914.

This liberally illustrated volume represents the proceedings of the Fifteenth Annual Convention of the American Ophthalmological Society, held on May 12th and 13th last, at Hot Springs, Va. Such of its contents as are suitable for the purpose will appear in abstract in our columns at an early date.

Anaphylaxis in Ophthalmology. (Die Anaphylaxie in der Augenheilkunde.) By PROF. DR. AUREL V. SZILY, Freiburg i/B. Stuttgart: F. Enke, 1914.

In this work an attempt is made to present the reader with an up-to-date survey of the subject of anaphylaxis, more especially in its bearings on ophthalmology, with the object of providing the ophthalmologist with a knowledge of the work already done, and of the methods employed in carrying it out.

The general section, which occupies the first sixty pages, deals with anaphylaxis in general, while the remaining two hundred pages are devoted to the experimental researches in which the eye plays an important part.

In the first chapter we have a carefully and lucidly written introduction to the subject, describing the phenomena whose occurrence gave origin to the conception of anaphylaxis, defining the terms, and indicating the relationships of anaphylaxis to the phenomena of immunity. Anaphylaxis is defined as the condition in which an organism which has been acted upon by an "antigen" is found, after an incubation period, to be hypersensitive to the same, or to a related substance. The author considers it proved that the difference between immunity and anaphylaxis is a quantitative rather than a qualitative one, both being the results of the "parenteral" digestion, or hydrolysis of protein. The symptoms of anaphylaxis are those of an intoxication, and the author's conception of the process is that sensitisation of the animal (the injection of the antigen), whether by cells or by free protein, excites the formation of amboceptors, by the union of which with antigen in the presence of complement, the anaphylactic poison is produced. It is usually assumed, although it has not been proved, that the mother substance of the poison is the antigen itself.

The original anaphylactic phenomena were those of a general hypersensibility. In ophthalmology greater interest centres in the more recently discovered "local anaphylaxis"—a heightened sensitiveness of certain tissues to certain toxins. The special section of the book is largely concerned with various aspects of this local anaphylaxis.

The second chapter deals with the *technique* of anaphylaxis experiments, the sites and methods of injecting the antigens, quantitative estimation of the reactions, and many other related matters.

The succeedings chapters review the literature dealing with the subject from the ophthalmological standpoint. Amongst other things we find experiments relating to the toxic and antigenic properties of the tissues of the eye, the production of generalised anaphylaxis by the intra-ocular injection of antigens, and the production of anaphylactic phenomena in the eye itself. It must be admitted that these chapters make depressing reading, consisting, as they do, of a dreary record of inoculation experiments whose bearings on human pathology usually appear to be excessively remote. The results of many of these researches are inconclusive or mutually contradictory, and the absence of any underlying harmony makes it impossible to sum up the matter for the benefit of the general reader. What is of the greatest interest to us as ophthalmologists is the suggestion that anaphylaxis and the allied phenomena may throw some light on the nature of certain still mysterious eye diseases, and naturally the experiments bearing on this aspect of the subject are dealt with fully.

Readers are already familiar with the author's own work on anaphylactic inflammation of the cornea, published in the *Klinische Monatsblätter für Augenheilkunde*, and with his further contribution dealing with the pathological anatomy of the anaphylactic ocular inflammations, communicated to the International Medical Congress in London last year. These researches, which produced such interesting and suggestive results, are included in the present volume and illustrated by a series of excellent plates. While they have proved the possibility of inducing, by the method of local anaphylaxis, inflammations which have a remarkable resemblance, both clinically and pathologically, to certain eye diseases, yet it must be confessed that the view that parenchymatous keratitis, sympathetic irido-cyclitis, cataract, and phlyctenular conjunctivitis are of an anaphylactic nature, is but slightly supported by evidence and remains but an interesting speculation.

To anyone who proposes to engage in research along these lines, v. Szily's book will be a valuable, indeed an indispensable, guide, and its usefulness is enhanced by its indices and the arrangement of its matter in such a way as to facilitate reference. A. J. BALLANTYNE.

Sympathetic Ophthalmia. (Die sympathische Ophthalmie.) By A. JESS. *Sammlung zwangl. Abhandl. a. d. Gebiete Augenheilkunde.* Bd. XI, Heft 8. Halle a. S. : Carl Marhold, Verlagsbuchhandlung, 1914.

Jess' pamphlet on sympathetic ophthalmia opens with a brief historical sketch in which credit is given to Mackenzie for the first clear and adequate account of the disease. The following pages contain a summary of the symptoms and signs of sympathetic irritation and sympathetic ophthalmitis. They do not bring anything new. A description of the pathological histology occupies a couple of pages, and the remainder of the paper is devoted to the various theories of the causation of the disease. The theories of migration, of ciliary irritation, of metastatic infection, and of local anaphylaxis are discussed *seriatim*. The well-known objections to the first three of these theories are cited, and with regard to the fourth, the writer observes that sympathetic differs from anaphylactic inflammation both in its clinical aspect (Brock) and in the histological appearances (A. v. Szily, Fuchs, jun.). The work of Elschnig, Guillery, Kümmel, and others is referred to.

There is a bibliography of considerable length. P. J. HAY.

NOTES AND ECHOES.

Death.

THE death is announced of Robert Hamilton, late of Liverpool. Many years ago Mr. Hamilton held the post of assistant surgeon to the Liverpool Eye and Ear Infirmary.

* * * *

The War.

THE greatest sympathy will be extended to our colleague, Mr. Henry Juler, whose second son, Lieutenant George Critchett Juler, fell in action in France on August 31st last.

From Dresden we learn that Dr. Wilbur B. Marple, of New York, has been of the greatest use to some of our compatriots stranded in that city on the outbreak of war. Dr. Marple's fluency with the German tongue, combined with his energetic and vigorous personality, has been of service in rescuing some of our countrymen from difficult positions, and in obtaining passage for them to the shores of their own country.

The fraternal spirit of ophthalmologists the world over is well brought out by the kindly offer of a widely-known American ophthalmic surgeon, who asks us to state that he will receive into his home the son or the daughter of any colleague who has suffered by the war. The child's education will not be neglected. He is further prepared to defray the passage of such a child from Europe to America. Any applications addressed to "L.H.," care of THE OPHTHALMOSCOPE, will receive prompt attention.

The following graphic letter from our esteemed colleague, Dr. Darier, of Paris, was written when the Germans were almost thundering at the gates of that city :—

Mon cher Stephenson,

J'ai été bien heureux de recevoir votre aimable lettre ; car je suis bien seul à Paris, puisque tous les amis sont partis et nous avons eu ces derniers jours des heures bien angoissantes à passer. Le gouvernement ne laisse rien publier par la presse. Nous croyons nos troupes sur la frontière et l'on nous dit le lendemain que nos lignes s'étendent de la Somme à Belfort ; puis nous apprenons que les Anglais ont pris dix canons allemands dans la forêt de Compiègne. Le lendemain, à Saint Denis, des fuyards nous annoncent que les Prussiens ne sont qu'à 30 ou 40 kilometres de Paris. On abat les arbres des avenues, on creuse des tranchées, on amène des canons, on barricade les portes. Enfin, trois jours de suite, les "Taubes" viennent jeter des bombes sur Paris, avec des messages comminatoires d'avoir à *nous rendre si nous ne voulons pas être bombardés.*

Puis les masses Allemandes obliquent vers le Sud-Est. Il leur faut avant de s'attaquer à Paris s'être débarrassés des armées alliées qui livrent bataille en ce moment sur une ligne qui s'étend de Paris à Verdun. Pendant ce temps la grosse artillerie de siège vient à pas comptés par Lille, Saint Quentin, Compiègne, pour tacher d'entamer les forts du camp retranché de Paris.

Nous attendons avec impatience des troupes Anglaises, Canadiennes, etc. . . Il nous faudra de la patience car elles sont innombrables les hordes barbares qui nous assaillent. Nos troupes sont toujours très allantes et très courageuses, mais les pauvres petits, ils sont toujours écrasés par le nombre, de même que les vaillantes troupes britanniques.

Ah ! mon cher Stephenson quand nous reverrons nous ? J'ai reçu une très bonne lettre de Wendell Reber. Je lui écrirai prochainement.

Embrassez bien pour moi toute votre chère famille et croyez à ma toute profonde amitié.

Dr. Darier.

Paris,
Le 8 septembre, 1911.

* * * *

The Herman Knapp Prize.

This gold medal, given by the contributors to the Herman Knapp Memorial Fund, is offered as a reward for the best communication presented to the Section on Ophthalmology of the American Medical Association. It has now been awarded to Dr. Clifford B. Walker, of Boston, for his work on the Wernicke pupil reaction and the Wilbrand prism test for hemianopia.

* * * *

Another Ophthalmological Society.

The proposal to form an Ophthalmological Society for the North of England has met with widespread approval and support. The society will be constituted at a meeting to be held at Manchester on October 15th. Gentlemen desirous of joining should communicate with Mr. Percival Hay, 392, Glossop Road, Sheffield.

* *

Ophthalmological Literature.

A feuilleton in the *Wochenschrift für Therapie und Hygiene des Auges* describes the voluminousness of the world's periodical ophthalmologic literature. According to the writer, whose figures differ slightly from those furnished by the list inside the cover of "Ophthalmic Literature," Germany publishes nine ophthalmologic periodicals; Italy the same number; the United States seven (three in association with the diseases of the ear, nose, and throat); France six, Spain and Mexico three, England, Japan, and Hungary two each (the last as supplements to general medical journals), and Austrian Poland and Russia one each.

The current year has already seen the birth of two new eye journals--the Italian *Archivio di Ottalmiatria* and the German *Zentralblatt für die gesamte Ophthalmologie und ihre Grenzgebiete*. Publication has been discontinued by seven earlier and two more recent German ophthalmologic publications, and also by five French, three Portuguese, two Spanish, Italian, and English, and one Danish Journal devoted to the speciality. Three independent ophthalmologic annuals have been published—Michel-Nagel's *Jahresbericht*, *l'Année Ophtalmologique* and the *Ophthalmic Year Book*. (The French *Année* stopped publication for want of support.) Germany, England, France, and the United States each publish independent reports of the proceedings of their national ophthalmologic societies.

The first regular journal devoted to ophthalmology was the *Journal für Chirurgie und Augenheilkunde*, published by von Graefe, senior, and von Walther, from 1820 to 1840. The oldest journal which has been published without interruption is the *Annales d'Oculistique*, published first in 1838 and now numbering 150 half-yearly volumes. The largest edition (of more than 1,000 copies) is issued by the *Klinische Monatsblätter für Augenheilkunde*. The total subscription price of all the journals is about $240. The published price of a complete collection of all the regular journals, except those which are defunct, but including the independent annuals and society proceedings, would be about $4,500. The most complete collection is probably that of Professor Hirschberg in Berlin.—*Ophthalmic Literature*, June, 1914.

* * *

Diploma in Ophthalmology. THE following were the questions set at the recent examination (July, 1914) for the Diploma in Ophthalmology of the University of Oxford:—

Dioptrics.

1. Describe the theories of Accommodation.

2. In Retinoscopy what is meant by the 'point of reversal'? How is it found practically? What are the appearances and how are they explained optically?

3. Draw diagrams to show the course of the rays both in the direct and indirect ophthalmoscopic examination, giving a separate diagram for the in- and out-going rays.

Relation of Ophthalmology to General Medicine.

1. Describe the ocular complications of Insular Sclerosis.

2. What is the clinical significance of inequality of the pupils apart from local ocular conditions?

3. What ophthalmoscopic changes are liable to be met with in the various forms of Nephritis?

Pathology.

1. How would you search for and identify the *Spirochæta pallida* in a Hunterian chancre of the ocular conjunctiva?
2. Describe the differential diagnosis of the various Gram-negative diplococci that may be found in the conjunctival sac.
3. Give an account of the microscopic changes found in the lens in (*a*) a recent, (*b*) a long-standing, case of anterior polar cataract.
4. Describe the pathological changes seen in a case of Hypopyon-ulcer, and explain the source of the Hypopyon and the infiltration in the cornea.

Diagnosis, Etiology, Treatment, &c.

1. Describe how you would investigate a case of diplopia apart from causation.
2. Enumerate the complications that may follow the extraction of Senile Cataract.
3. Give the differential diagnosis of a case of unilateral acute swelling of both lids, *without* proptosis.
4. Describe the differential diagnosis between Primary Glaucoma and Iritis. You are called in to see a patient with increased tension and a contracted pupil; on what signs and symptoms would you lay stress in determining the causation of the condition, and what treatment would you adopt?

THE OPHTHALMOSCOPE DIARY.

1914.

American Academy of Ophthalmology and Oto-Laryngology	October 19th to October 21st	Boston, Mass.

1915.

American Ophthalmological Society	July 6th & 7th	New London, Conn.
Oxford Ophthalmological Congress	July 15th & 16th	Oxford.

THE

OPHTHALMOSCOPE.

A MONTHLY REVIEW OF CURRENT OPHTHALMOLOGY.

VOL. XII.—No. 11.] *NOVEMBER 1, 1914.* [TWO SHILLINGS.

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ORIGINAL COMMUNICATIONS.

THE PRESENT STATUS OF THE HETEROPHORIA QUESTION.*

(Concluded.)

BY

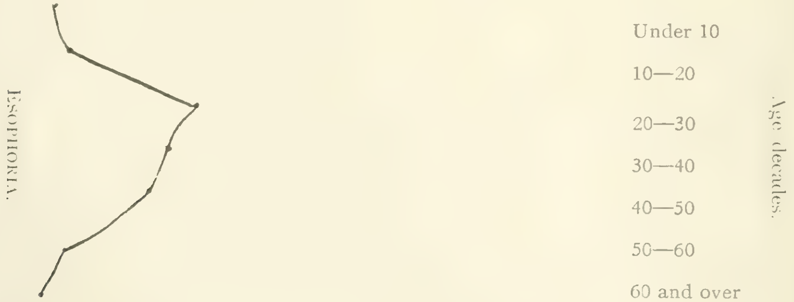
WENDELL REBER, M.D.,

PHILADELPHIA, PA., U.S.A.

Exophoria.

For years it has been taught that exophoria is a purely passive phenomenon due to want of tone or lack of energy or lack of stimulus to the convergent forces of the eyes. This conception must now be modified. It is true that a certain proportion of all cases of exophoria occurs in myopia, a condition which gives rise to subnormal accommodational activity, but I must direct attention to the series of 441 cases of exophoria which I analysed before the Boston meeting of the American Medical Association (*Jour. Amer. Med. Assn.*, 1906) in 1906. In this analysis it was shown that in 72 per cent. of all these cases there was an associated H + Ah refractive status, and inasmuch as all hypermetropic conditions call for excessive accommodative impulse, some other feature than subnormal accommodative impulse is necessary to explain the associated exophoria. Moreover, as with esophoria, the term exophoria, while clinically convenient, gives no clue as to whether convergence is deficient or divergence excessive. We may, therefore, classify exophoria as

1. Accommodative—when found with myopia.
2. Exophoria (in the presence of H + Ah) with normal divergence and deficient convergence (true convergence insufficiency).
3. Exophoria (in the presence of H + Ah) with normal convergence and excessive divergence.
4. Exophoria (in the presence of H + Ah) with convergence and divergence both subnormal. In such a case—if there is no complicating hyperphoria—we are probably dealing with a myasthenia as part of a general process in which constitutional treatment is the main thing.



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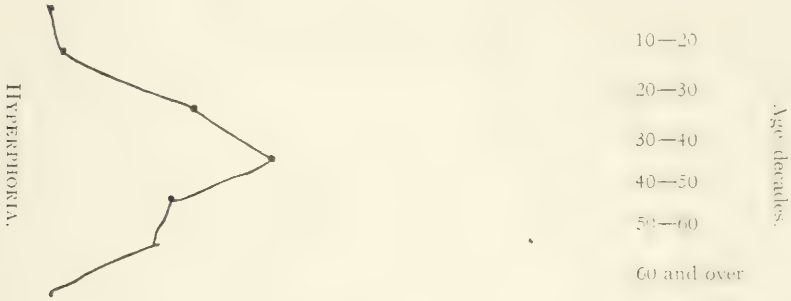
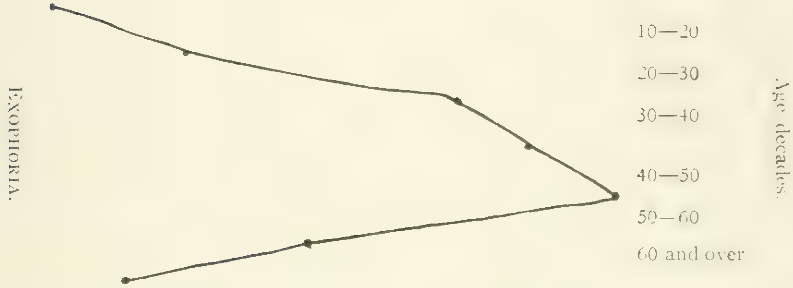
*A communication read before the Oxford Ophthalmological Congress on July 10, 1914.





In (1) myopic exophoria there is more or less of a ratio between the degree of exophoria and the grade of myopia. In most of such cases if a full correction of the myopia is given while the patient is young, the normal relation between accommodation and convergence is fairly well established and the exophoria is so slight in degree as to become a negligible quantity. If, on the other hand, the patient is given a near and a far correction, or, as is the custom in some quarters, a near correction only for constant use, the associated exophoria may become a problem requiring attention.

The main difficulty arises with hypermetropic states attended with either convergence insufficiency or divergence excess. These call for refinement of diagnosis. In all such cases it is well to learn the prism divergence, the prism convergence, and the convergence near point. Much valuable information is also to be obtained by measuring, as a matter of routine, the exophoria at the reading distance. This may sound rather formidable—but with the Maddox rod in position, the muscle balance for infinity is quickly arrived at, then the prism divergence and convergence are estimated*

Placing a small electric light in the patient's hand, and the Maddox rod again before the eye, the muscle status at 35 centimeters is easily found, and then removing the rod from the trial frame, the light is rapidly carried toward the patient's eyes until they no longer converge on the light (one or the other eye breaking away from the attempt) and the convergence near point is found† (approximately it is true), but quite close enough for all practical purposes).

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*With separate prisms the average prism divergence is from six to seven degrees, or P.D. With a rotary prism about eight degrees. With separate prisms the average prism convergence at the first trial will be about 12 to 15 degrees. With the rotary prism about 20 degrees.

†Of course the number of meter angles of convergence indicated by the convergence near point is influenced by the interpupillary distance, but in the normal adult with an average of 60 to 61 mm. interpupillary distance as a base line, the convergence near point should be at least within 3 inches of the root of the nose which is almost 4 inches from a line connecting the centre of rotation of the two eyes. Any convergence near point further away than this may be of significance in the study of the case.

Ten minutes should suffice for the completion of these tests if they are done as a matter of routine. We are now in a position in most cases to decide whether convergence is insufficient or divergence excessive. As a rule, when divergence is in excess we shall find that it aggravates an accompanying convergence insufficiency. A poor convergence near point (say of 5 or 6 inches, or 13 to 15 centimetres) is, in our judgment, more significant than an exophoria at the reading distance of 8 to 10 degrees, with a good convergence near point of, say, 3 or 2 inches, as it indicates a lowered convergence amplitude. In other words, a patient with but 4 degrees of exophoria at the reading distance, and a convergence near point of 5 inches (12 centimetres) will probably have more distress after work at the reading distance than another patient with 10 degrees of exophoria at the reading distance, and a convergence near point of 3 inches (7 centimetres). The latter patient has more potential convergence than the former, and can carry the deviation at the reading distance with less symptoms. Stevens and Valk lay much stress on the findings of the tropometer in such cases, but we rely more on the tests above outlined. As to age incidence, exophoria will be found most frequently between 40 and 50 years of age, as shown in the illustration.

As to the treatment, myopic states of refraction should be *fully corrected* and hypermetropic ones *under corrected*, as has been pointed out in speaking of the relation between accommodation and convergence. This will care for the accommodative cases, especially of the myopic variety.

Exophoria in general, along with esophoria and hyperphoria, imposes upon its victims the most regular life habits. Rational living comes first in the treatment of all muscular imbalance, but many such patients who lead the most careful lives present a train of symptoms directly referable to their exophoria which must be met in some way.

First in importance is training of the convergence faculty in some fashion. Prism training is much in vogue, and is done in many ways. It is necessary to reiterate that any prisms used for exercise should be mounted in some manner of frame. Separate prisms to be held in the hand should never be employed. Our own preference is for the method of Gould which "weights the convergence." The patient usually begins with a pair of 5 degree (P.D.) prisms (a total of 10) with their bases out, mounted in a frame. These are placed before the eyes and the patient gazes at a light on the level with the eyes about one foot distant from them, backing away from the light the whole way across a good-sized room. As the patient returns toward the light, the prisms are raised and dropped again before the eyes when the light is reached when he again backs away across the room, gazing fixedly at the light. These trips are made 10 times on arising and 20 times before retiring. Another method is to start with the prisms on the face at the end of the room farthest away from the lighted candle and gaze steadily at it as the light is approached, raising the prisms to the forehead as the backing away is done. This is apparently a reversal of the method just described, but is not so, in fact, as the prisms are used with their bases out in each case. The only difference is that in the method first described, advantage is taken of the strong convergence impulse put forth by the brain for all objects one foot distant, by requiring the patient to put forth this same impulse and hold it all the way out to 20 feet. In our hands this has proven one of the most valuable forms of prism exercise for convergence insufficiency. In divergence excess, it often accentuates the symptoms, unless taken up very gradually. For divergence excess, the lateral rotation exercises described under esophoria are of equal value here, strange as it may sound. It is a fact not sufficiently noted, that many of our patients can be rapidly taught to perform a number of co-ordinate ocular movements that will add greatly to their comfort in the use of their eyes, and this is one of the easiest ones. Converging exercises on a lead pencil point brought from arm's length to the convergence near point are also most helpful. In over 200 cases of exophoria of both types we have resorted to exercises alone, and have been gratified at the results obtained in 75 per cent. of the cases. A point that cannot be too much emphasised is that while convergence training will not often effect any objective reduction in the exophoria, the relief to the symptoms will be striking nevertheless.

The use of permanent prisms has been assailed by many authorities, not without some justification. Too often prisms have been prescribed in such cases either in unduly great strength or without sufficient study of the case. If, however, a patient has true divergence excess, has led a well ordered life, has trained with prisms, and still has marked symptoms of his muscular status, what shall be done? It is futile to argue that permanent prisms in such cases sap the power of the converging forces and strengthen by that much more the divergent forces. Clinical experience shows that relief is often thus afforded, and inasmuch as operation is the next step beyond this, we once more give our voice to the less dramatic practice of wearing prisms. In an abstract of cases from private practice made in 1912 it appeared that we had ordered prisms for constant use in 250 cases of exophoria, with relief to the patient's symptoms in 193 cases. In 26 cases they were of absolutely no value at all, and in 33 cases the results were unknown. These 250 cases were all free from hyperphoria, and therefore merit judicial consideration. All other means had been resorted to before permanent prisms were ordered, so that each time they were prescribed as the next logical step in the treatment. In about 25 per cent. of the 193 cases, the prisms were eventually increased in strength, the average increase being approximately 100 per cent. in an average period of six years. It is no more surprising that exophoria should increase under the use of prisms than that a patient should gradually manifest more and more of a latent hypermetropia as *plus* lenses are skilfully crowded on the eyes. I believe there are few cases of anatomic exophoria (due to orbital peculiarities, insertional anomalies, etc.), in which there is not a considerable element of latent exophoria unrecognisable with any of our tests, because of the overwhelming fusion impulse in such cases. There is no test comparable to the cover test when properly employed in these particular cases, as it breaks up fusion more thoroughly than any other test for the muscle balance with which we are familiar.

It is good practice in prescribing prisms for the exophoria of divergence excess, to employ prisms totalling not more than one quarter of the infinity deviation at the outset. A patient with eight degrees of deviation should have, say, one P.D. prism in each eye incorporated in the refractional correction; four to eight weeks' trial will decide whether they are of any value. In two to three years it may become necessary to add one-half or one degree of prism to each eye—but what of it? If the patient can be made comfortable on so simple a scientific basis, why hesitate? If a patient should in five years arrive at 3 or 5 P.D. in each eye, the weight of the glasses then becomes a consideration and operation may have to be thought of. But in most instances there is a way out of this dilemma, namely—to combine convergence exercises with the use of the permanent prisms when the eyes have become habituated to the latter. To our way of thinking, it is as wrong to order prisms *bases in* for permanent use without soon after training the convergence to the highest possible point as it would be to rest an inflamed joint and then not to exercise it afterwards. Indeed, it is surprising how such patients tolerate convergence training when once their convergence forces have had some rest.

Exophoria at the reading distance.—There is a class of patients (mostly presbyopes, and particularly those who are just beginning to use presbyopic lenses) who present but one or two degrees of exophoria for infinity, with anywhere from 10 to 15 degrees deviation at the reading distance (prism divergence being normal). Many of these respond nicely to convergence training if they can be made to do it. A certain proportion of them simply will not take the trouble, in which case a 1 P.D. prism may be incorporated in their reading correction with much confidence. It is well to hold over them the threat that if they do not co-operate in the matter of convergence training, stronger and stronger prisms will have to be used in their reading correction. This usually serves to bring them round.

Someone may be led to comment on the large number of exophorias here reported on. If, however, anyone will devote himself for a little while to the study of muscular anomalies he cannot but be struck with the preponderance of convergence anomalies (either convergence insufficiency, or divergence excess).

The truth of the matter is that a goodly portion of the civilized world have never developed their convergence power to anywhere near its full capacity. Convergence would seem to be one of the last acts added to us evolutionally, in which case subnormal convergence ability is simply a sign of insufficient adaptation to environment. This will explain why the convergence faculty can be so readily trained in many individuals.

As to operation, we shall briefly say that out of over 500 exophorics whom we have studied, but 22 have come to operation. Because of the preponderance of the divergence forces we feel that tenotomy is perfectly safe in this class of cases ; moreover, it can be adjusted with infinitely more accuracy than any advancement operation ; and our preference therefore is for tenotomy done invariably under local anæsthesia with the Maddox rod at hand all the time to gauge the amount of effect secured. Only one of the above cases turned out poorly.

Hyperphoria.

Hyperphoria, like esophoria and exophoria, is simply a term of clinical convenience. The visual tests simply indicate that one visual axis is higher than the other. Some refinement of diagnosis is required to determine which is the abnormal axis, and at times this is not possible.

Three methods are in vogue for this purpose. First, estimation of the supra- and infraduction (or breadth of vertical fusion). The two forces should normally be equal ; that is, if a prism of two degrees is the most that can be overcome base up before the right eye, the same should be true of a prism base up before the left eye.

In right hyperphoria of one degree the right supraduction would be likely to be four degrees and the left supraduction two degrees. In other words, the difference in supra- and infraduction will be generally about twice the degree of the hyperphoria.

Second.—One way is to estimate the arc rotations with the tropometer, in which case the upward rotation of the right eye in a right hyperphoria should exceed the upper rotation in the left eye. One other procedure of value is to carry a small electric light into the extreme upper left and right binocular motor field. If any diplopia can be elicited in the extreme upper portion of this field, there is probably a paretic condition (usually congenital) of one or the other superior recti giving rise to a true *hypophoria* of the eye containing the paretic muscle, instead of a *hyperphoria* of the fellow eye. It goes without saying that hyperphoria during or after middle life should always give rise to the suspicion of beginning central nervous disease, and this should invariably be excluded. Also, a hyperphoria that disappears after the putting on of a spherical or spherocylindrical correction, is a spurious or pseudo-hyperphoria that deserves no consideration.

As contrasted with esophoria or exophoria, which will vary from time to time, hyperphoria is amazingly constant in its degree even for years. Maddox thinks that in many cases it is congenital, and I quite agree with him. Perhaps this is because hyperphoria is probably often due either to abnormality in the orbital build or to anomalous insertion of the tendons of the vertical muscles. To this attention has been drawn in the paragraph on anatomical considerations.

Age Influence.—Like exophoria, hyperphoria is much more in evidence between the years of 30 and 50, while esophoria belongs to the earlier decades of life. Indeed every presbyope deserves careful interrogation of the state of the ocular muscles, as hyperphoria when manifest may explain many symptoms that were obscure. When latent it is much more likely even in non-presbyopes to manifest itself either as an esophoria or an exophoria. In this particular field Stevens has been pre-eminent, and to him all honour is due for his insistent teaching on this subject. Esophoria is frequently the only outward sign of a hyperphoria until the case is deeply studied, and every case of exophoria is open to the suspicion of being the herald of a latent hyperphoria until the latter element has been absolutely excluded by the most searching diagnosis.

Exercises for the relief of hyperphoria have been in our hands an utter failure—that is to say, the prism exercises that have been generally tried. Vertical rotational exercises, performed as are the lateral rotational exercises, have been helpful in a few instances, but even here there are sharp limitations.

Rest prisms.—Although authorities may be divided as to the wisdom of permanent prisms in lateral deviation, there is almost unanimity in their attitude toward relieving prisms for constant use in hyperphoria. Brilliant results often attend their use. I could recite from my own private records all manner of astonishing results from the use of vertical prisms in the relief of obscure nervous symptoms, but time and space do not permit.

One thing is plain. Full prismatic correction of a hyperphoria at the start is not often indicated. It is much safer (and saner) practice to incorporate not more than one-third to one-half the infinity deviation in the refractive correction to begin with. In other words, it is wise to feel one's way, for prisms at first do greatly disturb the patient's visual judgments, and weak ones are much more apt to be kindly tolerated and to accomplish their purpose. In looking over my records I find that I have ordered vertical prisms for permanent use in 376 cases. The results were brilliant in 192 cases, great improvement resulted in 195, no improvement was recorded in 74 cases, and the result is unknown in 15. We cannot put down the feeling that a practice that has produced a favourable outcome in 297 of 376 cases has justified itself.

Of the 74 cases that showed no improvement 30 came to operation, which in every case was tenotomy of the superior rectus, combined in five with advancement of the inferior rectus of the same eye. Of these 30, four showed no improvement and one was made much worse by operation. This one was a case of anaphoria in which both visual axes were directed above the horizontal plane of the head, the left eye riding six degrees higher than its fellow. The upward rotations were 10 degrees above normal in the right eye and 13 degrees above normal in the left eye. Kataphoria is rare. Cyclophoria is usually associated with oblique astigmatism, and while of academic interest, seldom presents itself as a practical problem in the consulting room.

To sum up, we may say that muscular anomalies are to-day recognised as deserving of notice in routine ophthalmic work, and as civilization imposes more stress upon the visual apparatus, they will have to be reckoned with.

Esophoria is quite amenable to the kindly influence of a good refractive correction. Exercises are sometimes required, permanent prisms quite infrequently, and operation almost not at all.

Exophoria is much more assertive ; not so amenable to refractive corrections alone ; generally requires training, to which it is disposed to respond readily ; will often require permanent prisms, and sometimes operation.

Hyperphoria seems almost independent of refractive status, does not respond well to training, very frequently demands prisms, and a little oftener than exophoria, will call for operation.

This is the superstructure to be built up on the solid foundation of the best possible general health and life habits ; for we are medical men first and ophthalmic surgeons afterwards.

(*The End.*)

THE TREATMENT OF TRICHIASIS.

BY

T. HARRISON BUTLER, M.D.

LEAMINGTON SPA, ENGLAND.

TRICHIASIS is so comparatively uncommon in England that a short account of the methods that I finally selected as the best after four years' work at the British Ophthalmic Hospital in Jerusalem may be of some use to those of my colleagues who are only called upon to treat trichiasis occasionally, and in consequence may be in some doubt as to the best methods to adopt in any individual case.

Trichiasis may be caused by entropion or by a growth of adventitious lashes in a false position, the so-called "distichiasis," or by a combination of both causes. It may be found at any age ; in the East I have had to operate upon children of three years old. It may be present in any degree of severity. In severe cases all the lashes may sweep the globe, and in advanced trachoma the palpebral slit may be contracted by conjunctival atrophy and distortion of the tarsus until the eye is almost immobile. Fortunately, few European surgeons are called upon to treat such cases. In slight examples partial entropion may invert a few lashes, or there may be one or two adventitious cilia which touch the cornea.

Trichiasis may cause little or no trouble. I have often seen cases in which a whole row of cilia brushed the cornea without causing discomfort. On the other hand, one or two lashes impinging upon the cornea of a sensitive individual may cause intense pain. A complete secondary row of lashes may develop along the inner margin of the lid, and sweep the globe. These cases are difficult to treat by any splitting operation.

Trichiasis is caused by trachoma, by chronic blepharitis, and by spasm of the orbicularis. The last two causes are commonest in England.

The object of any operation undertaken to cure trichiasis must be, in the first place, to effect a permanent cure, and, in the second, to remedy the defect without producing lagophthalmos or any other deformity.

Trichiasis operations naturally fall into two groups.—Those in which the tarsus is split from the edge, and those in which it is divided transversely.

There is a third group of operations applicable only to trichiasis localised at the canthi.

Operations in which the tarsus is not attacked need not be considered, for in any but the most trivial cases they are quite ineffectual.

After performing over a thousand operations for trichiasis, I have found that the following methods meet all cases :—van Millingen's, Snellen's, a modified Spencer-Watson, and simple excision with a lip graft.

The "splitting operations" which I have tried are, the Jaesche-Arlt operation, a combination of Arlt's operation with Hotz's ; Waldhauer's operation and van Millingen's operation.

I have given the simple Jaesche-Arlt operation a very full trial, and have found it useful only in slight cases. In severe cases the tarsus is thickened, often to an enormous extent—I have seen it at least 3·5 mm. thick. There is much more cicatrisation at its ocular than at its outer surface, and in consequence it is in tension, and has a constant tendency to spring inwards. This tendency is more marked on its inner aspect. When the lid is split, the inner lip contracts, and incurves ; in consequence the outer lip, bearing the cilia, has no support, even when the skin has been shortened, and the cilia tend to drop inwards. A large gap is left which closes by cicatrisation. This cicatrix contracts, and draws the lashes inwards again. For this reason these operations are often in severe cases a failure from the first, and, even if the first result be good, they soon relapse. I have known an apparently good case return in a month to be permanently cured by van Millingen's operation. In order to remedy this defect, I made the split more oblique, so as to detach completely the lash-bearing edge, I then stitched it down to the tarsus higher up in such a way that the lashes pointed rather upwards at first, thus combining the procedures of Arlt and Hotz. The results of this modification were good as regards permanent cure, but a large gap was left, and much thickening resulted from the healing process. J. W. Barrett, of Melbourne, has highly recommended this operation, and he stitches the inner lip to the lower lid for a day or two in order to keep the gap open for a longer time (*vide* THE OPHTHALMOSCOPE, Vol. II, No. 9). After performing the operation a large number of times, I have abandoned it on account of its bad cosmetic effect.

In Waldauer's modification of the Jaesche-Arlt operation, the split is made obliquely, so as to detach the lower edge of the outer lip of the split, and the piece of skin removed is left attached at its extremities and pushed down into the split. It is adjusted in place, and readily grows there. The first result is excellent. So good is it that I was at one time led into performing the operation a large number of times. But after a few months nearly all the cases returned. In all of them the hairs of the skin-graft had hypertrophied, and the artificial trichiasis thereby induced was as bad as the primary condition. In a few of the cases the skin-graft had become much broader, pushing up the lashes and causing a very ridiculous effect. In all these cases I was obliged to cut out the skin and substitute a lip graft. It may be laid down as a rule, without exception, that *skin may, in no case, be grafted into the lids internally to the lashes.* It will always cause a secondary trichiasis.

van Millingen's remains the only satisfactory splitting operation. After performing it frequently, I have reached the conclusion that it is by far the best of all operations for trichiasis. It is especially indicated where there is conjunctival atrophy, where the tarsus is short, and in relapses from other operations, especially from Snellen's. It is perhaps rather a severe procedure in very slight cases, and it takes longer to perform than Snellen's method.

The operation is performed in the following manner.—The patient should be instructed not to epilate his lashes for a fortnight before. He should be anæsthetised, and the cilia cut quite short from both upper and lower lid. The lids should be disinfected by being washed with warm water and soap, with alcohol, and with a solution of biniodide of mercury, 1-500. A Snellen's clamp is now inserted backwards, and the lid everted. A very much better clamp for the purpose could be constructed, but Snellen's suffices. The lid is now carefully split from end to end of the clamp, the clamp is removed, and the split continued upwards and inwards into the skin surface at each canthus. It may be carried 1—2 mm. into the skin, and deepened to 7 mm. It is essential that the split shall be long and deep, so that it loses its tendency to close, and gapes naturally. If the trichiasis extends to the canthi the split should be carried well into the skin at each end. Any vessel seen to be spouting should be twisted. The clamp is now inserted in its natural position, and a piece of skin removed from the lid, exactly as in the Arlt operation. Its breadth will depend upon the amount of loose skin in the lid. In many cases it is unnecessary to remove any at all. The skin wound is now sewn up, and the clamp removed. As soon as the bleeding from the split tarsus has ceased, the inner lip of the wound should be carefully examined with a lens to detect hair follicles. Should any be found, they must excised with scissors. If any roots are left behind, they will grow and appear between the inner lip and the graft, in a very undesirable position. The patient should be well under the anæsthetic. A pad of wet wool is placed inside the lower lip, which is everted and compressed at each end between the fingers and thumbs of the assistant. With a sharp knife, a graft, 2·5 mm. broad and as long as the split, is marked out and detached with a pair of sharp scissors. While the assistant sews up the lip wound, the graft is spread on the back of the hand, and the submucous tissue removed with curved scissors. If there is no bleeding from the wound, it is gently scraped, to provoke a little hæmorrhage, and the graft adjusted in place. It should be gently pressed until the blood has coagulated under it and has luted it down. Should there be trichiasis at the canthi, the graft must be long enough to enter the skin. As soon as all hæmorrhage has ceased, the graft is gently wiped clear of blood-clot, and the eye irrigated with boric lotion or normal saline. The lower lid must now be well greased with boric-vaseline, to prevent any possibility of the graft adhering to it. A piece of well-greased oil silk is used as a dressing, which should be removed after forty-eight hours. The greatest care must be taken that the graft does not adhere to the dressing, which should be taken away by the surgeon himself. The eye should be kept covered for four days, or the graft may become desiccated. If these precautions are followed, the graft will almost invariably adhere. If the lid be insufficiently split, the graft may be squeezed out of place. If at the first dressing it is found that this has happened, the split should be reopened and the graft inserted again. It has a most extraordinary vitality, and this procedure is generally successful. After a very few days, the graft can hardly be distinguished from the conjunctiva. The only failure that is common is the appearance of one or two lashes internal to the graft. These lashes must be removed by two curved incisions, which include the lashes, and are deep enough to enable the root follicle to be excised. If the lid be tightly held in Grady's forceps, the operation is almost painless.

If it is decided to perform the operation on a case of distichiasis, where the lashes spring from the extreme inner margin of the lid (a very common state of things), the split must be made first in a transverse direction, and then parallel to the lid surface. In this case there will be several root follicles on the inner lip of the wound. These must be removed. van Millingen's operation is perhaps not best suited to these cases, but there is often so much atrophy that Snellen's operation would inevitably produce lagophthalmos.

The chief operations in which the tarsus is divided transversely are Snellen's, Panas', and Burow's.

I have found that Panas' operation, although very efficient, causes much ugly thickening, and in cases where there is much atrophy, the lash-bearing fragment is liable to slough.

Burow's operation is liable to an early relapse. The tarsus is divided from the inside, and the contraction of the cicatricial tissue formed draws the lashes inwards.

Snellen's operation, as modified by Cant, has been performed in the British Ophthalmic Hospital, Jerusalem, considerably over ten thousand times. In selected cases, it gives an excellent result, and the cosmetic effect is almost always good. In fact, in the majority of cases, it is difficult to tell that an operation has been performed. In order that it may be successful, it is necessary that the tarsus be of good breadth, the operation must on no account be repeated, and there must be no conjunctival atrophy. If the trichiasis extends to the canthi, the operation must be combined with canthoplasties at either or both angles.

The objections to the operation are that a considerable number of the cases relapse, and if the tarsus be short, or the operation be repeated, lagophthalmos results. If there be much atrophy, the lower fragment may slough, wholly or partially. A canthoplasty does not seem to render sloughing more frequent.

Cant's modification of Snellen's operation is performed as follows.—Snellen's clamp is inserted, and the skin divided from one end of the clamp to the other, close to the lid margin. A second incision is carried through the skin at a height above the first which is gauged by the amount of loose skin in the lid. The piece of skin between the two incisions is removed. It is generally about 3·5 mm. broad. The skin is reflected upwards, cleansing the tarsus and removing the fibres of the orbicularis. The "cartilage" is now incised from one end of the clamp to the other, close to the roots of the cilia, and the incision is carried down to the conjunctiva. A second incision is made parallel to the first from one to two millimetres above it. This incision is also carried down to the conjunctiva. The narrow strip of tarsus included between the two incisions is now removed with scissors, leaving a long trough, the floor of which is formed by the conjunctiva.

The lower cilia-bearing fragment is now sutured to the tarsus above the trough, as in Hotz's operation, by four sutures. These sutures may or may not include the skin. When the sutures are tied after removing the clamp, the cilia will all be everted. In very slight cases, the piece of tarsus removed may be a mere shaving, or one incision may suffice.

The first incision must not be made too close to the roots of the lashes, or they may fall out and cause alopecia; on the other hand, the nearer the trough is made to the margin of the lid the better the eversion.

van Millingen's and Cant's operations are applicable to most cases of trichiasis. For slight cases Cant's is the better. It takes a shorter time, the cosmetic effect is certain, and it is a much less formidable operation. On the other hand, it weakens the tarsus and shortens it. The trachoma also tends to shorten the tarsus. In severe cases, or where the trachoma is still progressive, it should not be done. van Millingen's operation, on the contrary, lengthens the conjunctiva which is being shortened by the disease, it removes nothing, and so it can be applied to all cases. Cant's operation is very prone to result in recurrences. I have never seen a recurrence from van Millingen's. They probably occur as the disease progresses, but the operation can be repeated. It must be borne in mind that in the East, babies in the first year of their life may have pronounced follicular trachoma ; in the third they may have trichiasis. In such cases, where the tarsus has a lifetime in which to shrink and curl inwards, no operation which removes tissue should be performed. For children with trachoma, van Millingen's operation should always be chosen.

For trichiasis of the lower lids, I always perform Snellen's operation, exactly as for the upper lid. If, however, as is often the case in young children, the lids are much rolled in, Panas' plastic operation must be adopted. It gives good and permanent results, with little or no deformity.

In certain cases where there is much atrophy combined with entropion of the upper lids, van Millingen's operation might be first performed, and later on be followed by Cant's. When the trichiasis is confined to the canthi, the Spencer Watson operation gives excellent results : it is better, however, to truncate the tongue of skin which is placed into the split tarsus, and to fill in the gap with a piece of lip tissue. This operation was fully described by me in THE OPHTHALMOSCOPE, Vol IV, No. 7, p. 377. Isolated cilia are best excised with their follicles by a wedge-shaped incision, the gap can be filled in with a piece of lip tissue. This operation was also described in THE OPHTHALMOSCOPE, *loc. cit.*

The common form of trichiasis seen in old people caused by spasm of the orbicularis of the lower lid, is best treated by reflecting the skin, removing a small piece and then reflecting back the fibres of the orbicularis, and dividing them. It is generally unnecessary to remove a piece of the tarsus. Three sutures are introduced, exactly as in Snellen's operation.

I have found local anæsthesia unsatisfactory in any operation in which the tarsus has to be incised, and have always used ether, inducing with gas or with ethyl chloride. I prefer the Clover apparatus for these short operations, and a competent anæsthetist can always keep the apparatus out of the operator's way.

I take this opportunity of stating that in all my eye operations requiring general anæsthesia, such as acute glaucoma, I always refuse to operate under chloroform, and insist upon ether. I have seen too many deaths from chloroform to take the responsibility of allowing my patients to be anæsthetised with it, and I have had no difficulty whatsoever in any class of patient, always provided that the anæsthetist is competent.

THE TREATMENT OF TRACHOMA BY CO_2 SNOW.*

BY

G. MONTAGU HARSTON, M.D. (Lond.), D.O. (Oxon.)

HONG KONG.

WE may reasonably judge the amenability of any disease to treatment by the multiplicity of remedies evolved for its cure. In trachoma we have a disease which is more ancient than any of the plagues of Egypt, and which is comparable only to pruritus ani as regards the multiplicity of its remedies. It is indeed questionable whether we may not regard effluxion of time as an effective remedy provided the eye is kept clean.

We have to consider what constitutes cure in trachoma. Opinions differ widely on this subject. To take two extreme views we have, on the one hand, the opinion of the patient, who is quite satisfied with absence of discharge and freedom from subjective symptoms: on the other hand, we may have the political opinion of an United States immigrant official, whose medical adviser on detecting scarring of the conjunctiva, advises exclusion of the would-be immigrant.

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*A communication to the Oxford Ophthalmological Congress read on July 9th, 1914.

I have ventured to place the patient's own opinion first because it introduces a very practical problem in the treatment of trachoma, *viz:* the question of a rapid cure.

I frequently have this problem presented to me in the following manner: a patient consults me who has already been rejected by the United States Consulate officials. Under penalty of forfeiture of a considerable monetary bond, he has to return to the United States of America within a certain period of time. He has just concluded a trip from the United States to his native village in China, in order to prove his viability, and also to renew acquaintance with his ancestral hall, where his name has been duly inscribed. Incidentally, he has renewed acquaintance with the one wet towel which is common to the whole family. As a result of this, he has developed trachoma. I may state in passing that the wholesale spread of trachoma in China is due to this habit of the family, indulging in the use of one towel common to all members of the household, which towel is always kept in a wet condition, for the Chinese abhor the use of a dry towel. The request of this patient, then, is that he may be cured of his trachoma with the utmost rapidity, in order that he may embark on a certain date and thus retain his bond. Formerly, one hesitated in prophesying the date of his ultimate cure. Since the introduction of solid carbon dioxide, however, in the treatment of trachoma one is able definitely to set a period to one's labours. In a chronic case I specify three months as the limit of time required; in a recent case I may need six months to effect a cure.

What then do I mean by a cure? I consider a case of trachoma to be cured if the following conditions are complied with:—

1. Absence of discharge of any kind, whether purulent, sero-purulent, serous, or lacrymal.

2. A smooth appearance of the palpebral conjunctiva, and an absence of hypertrophy in the conjunctiva of the fornices.

3. The reduction of pannus to a minimum, as revealed by the presence of old involuted vessels in the superficial layers of corneal epithelium, if Bowman's membrane has remained intact; and by the presence of old opacities if Bowman's membrane has been destroyed in parts and the superficial layers of the substantia propria have been involved in the trachomatous process.

4. The absence of any gross deformity of the lids, such as entropion.

With the exception of the last condition, all these may be obtained by the use of solid carbon dioxide for 30 seconds once in 10-14 days, in the course of three months in a chronic case and in the course of six months in a recent case.

In the *British Medical Journal* of July 15th, 1911, I reported a consecutive series of fifty cases of trachoma treated in this manner. All who persisted in the treatment were cured; three only of the fifty did not continue the treatment. Since that time I have treated over 7,000 cases of trachoma, with equally successful results. This method of treatment has been adversely criticised in some clinics, but I still maintain that it constitutes the most rapid method of cure when employed in conjunction with other recognised methods of hastening recovery, such as the maintenance of cleanliness, "expression," when needed, with Knapp's roller forceps, the treatment of pannus by means of X-rays, and the treatment of entropion by Snellen's operation.

Method of procedure.—The snow is collected in a Prana cage and rammed down tightly into a cylindrical mould; if preferred, a specially-shaped mould may be used, so that the stick of snow may be shaped to fit the everted lids. I generally prefer, however, to sharpen the cylindrical stick to a pencil point. The surgeon stands behind the patient, and everts the lids in the ordinary manner. In Europeans I instil cocaine and adrenalin before applying the snow, but Chinese stand the application well without an anæsthetic. The transitional folds are made to stand out prominently, and the snow pencil is applied horizontally to the everted lids, with very firm pressure, for 15 seconds at the first application and for 30 seconds at all subsequent ones. Care must be taken to avoid contact of the snow pencil or the frozen conjunctiva with the cornea. I generally run my forefinger over the everted lids to make sure that no gritty particles are left behind on the conjunctiva. After an interval, the lids are replaced. The ensuing pain is infinitesimal when compared with that which follows the application of "bluestone" and other caustics. After two minutes, the patient can open his eyelids without any ensuing blepharospasm.

In Fuchs' clinic the chief objection raised to the method is the extensive scarring which is alleged to follow, and in Egypt the unsuitability of the method for large clinics. With regard to the latter, in my Hong Kong clinic I treat as many as 50 patients at one sitting. With reference to the excessive scarring, I can only say that such has not been my experience in over 7,000 cases. Furthermore, I wish to state my belief that the alleged excess of scarring may possibly be due to too frequent application of the remedy, the snow being reapplied before all reaction has subsided from the previous application. I find that the reaction subsides in from 10 to 14 days, but if only light application has been made, all reaction subsides in a week. I do not, however, recommend light applications, because they are just as painful and not so effective as firm applications.

Cases with much papillary overgrowth take the longest time to cure, and it is in these cases that excessive scarring is liable to occur with too frequent applications. In such cases I advocate 14-day intervals in the applications, with very firm and prolonged pressure. In some cases I have applied the snow with firm pressure for as long as 40 seconds.

Rationale of Treatment by Snow.—The application of solid carbon dioxide induces a chronic hyperæmia of the conjunctiva; in fact, we have in this method of treatment a modification of Bier's hyperæmic treatment so useful for other forms of granulomatous disease. The action of the remedy is exactly comparable to the action which follows application of a pressure bandage to the knee in tuberculous disease of that joint, and I attribute the beneficial effects to the chronic hyperæmia induced.

In conclusion, I would earnestly request those of you, my readers, who are or who may be brought into contact with this disease, not to be misled by what are, in my opinion, misleading reports of the results of this treatment, but to try the method I advocate and to judge the results for yourselves.

CURRENT LITERATURE.

NOTE.—Communications of which the titles only are given either contain nothing new or else do not lend themselves to abstract.

I.—COMPARATIVE ANATOMY.

(1) **Ischreyt, G.**—The comparative morphology of the eye in the Duck family. (Zur vergleichenden Morphologie des Entenauges.) *Arch. f. vergleich. Augenheilkunde*, Bd. IV, Heft ii, S. 162, 1914.

(2) **Fey, W.**—The caruncle of carnivora. (Ueber die Tränenkarunkel bei Karnivoren.) *Arch. f. vergleich. Augenheilkunde*, Bd. IV, Heft ii, S. 182, 1914.

(1) In this third and final paper (for reviews of his former contributions see THE OPHTHALMOSCOPE, Vol. X, p. 587, 1912, and Vol. XI., p. 479, 1913) **Ischreyt**, of Libau, records the anatomical examination of the eyes of two more species of the duck family, and reviews the whole of his material.

Zoologists divide the family into the fresh water or swimming ducks (*Anatinæ*), the sea water or diving ducks (*Fuligulinæ*) and the Merganser (*Merginæ*). In the swimming ducks, according to Ischreyt, the eye is short, the iris slender, and the musculature of both the iris and the ciliary body relatively weak, the muscle of Crampton (running from the periphery of the cornea to the sclera) being the best developed portion.

The anatomical characteristics of the divers cannot be so simply classified. In the eye, which may be regarded as typical of the class, the antero-posterior axis is long and the whole apparatus of accommodation is strongly developed, the muscle of Crampton, however, being relatively weak. This corresponds with what is found in other diving birds, a powerful accommodation being evidently desirable when the refraction at the corneal surface is abolished during immersion. But not all the diving ducks are so provided, the conditions in *Fuligula* approximating to those found in the swimmers, while in other instances (*Somateria*, *Oidemia*) the typical diver form is more nearly approached but not attained. Ischreyt concludes therefore that the swimmer form is primitive, and that the diver form is a special adaptation to a new manner of life, which has not in all instances reached its fullest development. In further support of this thesis he points out that the swimmer type is that which is common to nearly all birds, while the diver type occurs in widely different species which share in common the habit of seeking their food under water.

The general bearing of these observations on the zoological classification of the ducks is discussed. GEORGE COATS.

(2) The caruncle of man has been the subject of many histological studies, and the exact classification of its glands is a point round which a certain amount of controversy has raged. Waldeyer believed that sweat glands of the nature of the glands of Moll in the eyelid were present, while Krause described acinous glands, which he regarded as belonging to the accessory lacrymal system. Most recent authorities seem to have been unable to confirm Waldeyer's observation, but sweat glands are undoubtedly present and largely developed in the pig. In other animals also the caruncular glands are of considerable importance.

In the present paper **Fey**, of Zürich, contributes a careful study of the caruncle in some of the carnivora. In the dog, he finds, it varies in size, form, and degree of pigmentation, and presents a system of horizontal furrows. Goblet cells are found in the epithelium and form "intraepithelial glands." The deeper glands differ in some respects from the lacrymal type; the intercellular secretion-capillaries characteristic of serous glands, are absent, a mucin reaction may be present in some of the cells, and the ducts present some structural peculiarities. Sweat glands are undoubtedly present, although scanty. The pigment is chiefly in the deepest layers of the epithelium.

In the fox the structure of the caruncle is simpler, and apparently sweat glands are absent. In the cat goblet-cells are abundant, the hairs are relatively coarse, sweat glands are present, but a proper caruncular gland is absent.

GEORGE COATS.

II.—METHODS OF EXAMINATION.

(1) **Salzmann.—The ophthalmoscopy of the iridic angle. (Die Ophthalmoskopie der Kammerlicht.)** *Zeitschrift für Augenheilkunde*, Januar, 1914.

(2) **Bielschowsky, A.—The methodical examination of squinters. (Ueber das Unsuchungsprogramm des Schielens.)** *Zeitschrift für Augenheilkunde*, Januar, 1914.

(3) **Juler, F. A.—A lecture on squint.** *Polyclinic*, June, 1914.

(4) **Wolff.—Upon skiascopy with Gullstrand's Nernst slit-lamp, and a plate of unsilvered glass. (Zur Skiaskopie mit der Gullstrandschen Nernstspaltlampe und unfoliierter Glasplatte.)** *Zeitschrift für Augenheilkunde*, Juli, 1914.

(1) **Salzmann**, director of the Eye Clinic at Graz, describes a new method of examining the iridic angle.

If the patient be made to face in a direction at right angles to the observer's line of vision, the iridic angle can, under certain circumstances, be examined by indirect ophthalmoscopy. The observer must be at a greater distance than is usual in ordinary indirect ophthalmoscopy of the fundus, the lens must be held further away, and must be slightly tilted toward the astigmatism present at the extreme periphery of the cornea. It is rather difficult to find the exact position of the lens which gives the best picture.

The appearance of the iridic angle is shown by a plate with six coloured illustrations. When the anterior chamber is deep and the cornea large, it is easy to make the examination described, myopic and buphthalmic eyes being the most favourable for the purpose. If the anterior chamber be abnormally shallow, the use of a contact glass is advised. The second portion of Salzmann's paper discusses the optical features of the problem, being the explanation upon Weierstrass' construction. The third portion is devoted to the ophthalmoscopical picture of the iridic angle under different circumstances. The last section describes the pathological changes which may be discovered by this method of examination.

T. HARRISON BUTLER.

(2) **Bielschowsky**, of Marburg, read a paper to the Congress of Hessian

ophthalmologists at Frankfort, in which he sketched out a programme for examining squinters. In taking the family history, it is necessary to try to get evidence of hereditary predisposition to strabismus and of a well-marked neuropathic inheritance. We must enquire whether the child has suffered from diseases affecting the central nervous system. Then, we must ascertain when the squint was first observed, and whether it was, or is, periodic or constant. The general examination must be directed to discover the existence of a neuropathic disposition as evidenced by undue excitability or abnormal energy. The shape of the skull must be noted with especial reference to facial asymmetry. The interpupillary distance must be measured. Now make a superficial estimation of the nature of the squint while the child looks at a distant object. Is it manifest, or does it only appear when binocular vision is abolished? Is it alternating or absolutely or occasionally unilateral? The visual acuity must be tested, and the refraction estimated in older children without a mydriatic (*sic*). Children under four need atropine to enable the refraction to be worked out by retinoscopy. The angle of the squint must be measured, with and without the correcting glasses. It must be measured with the eyes directed to a distant object, then to the right and left, and, finally, when looking up and down. It must be again registered at the reading distance in the primary and secondary position of the point of view. Any difference between the primary and secondary angle must be noted. Very often we find a concomitant lateral deviation associated with a dissociated (non-concomitant) vertical deviation. It is very useful to take a photograph. In ordinary cases an exposure when the eyes are directed at a distant object is sufficient.

Diplopia is an important subjective symptom, and must always be looked for, because it affords the most accurate measurement of the angle of squint under all the circumstances noted above. It gives evidence of abnormal correspondence of the retina, and is of great value in estimating the probable effect of treatment. We must note whether it is spontaneously noticed, or whether it appears only when the best eye is covered with a smoked glass or by the use of prisms. The strength and position of the prism which elicits diplopia must be registered. We now observe whether or not the position of the double images corresponds with the normal retinal correspondence, and if not, note in what sense the position is abnormal. Fusion testing comes next, using the stereoscope or a prism apparatus.

Careful notes must be made as to the effect of treatment, especially in cases which have undergone operation. The chief difficulty in squint operations lies in the impossibility of accurately gauging the effect produced, especially in advancement operations. But in spite of this, advancement is the correct operation. Considerable over-correction is necessary if final success is to be attained. T. HARRISON BUTLER.

(3) This comprehensive lecture on squint by **F. A. Juler**, of London, will appeal more to the general practitioner of medicine than to the eye specialist. Speaking of the diagnosis of amblyopia in a young child, the author adopts the corneal reflex test. Thus, when light is thrown by the ophthalmoscopic mirror into the squinting eye, the sound eye being meanwhile covered, if the corneal reflex be stationary and approximately central, the sight is believed to correspond roughly to 6/36 or better. On the other hand, if under similar circumstances, the eye remains strongly convergent or the corneal reflex does not remain stationary, the vision of the eye is believed to range from perception of light to 6/60. SYDNEY STEPHENSON.

(4) **Wolff**, of Berlin, describes a method of performing retinoscopy with a Nernst lamp provided with a slit which can be rotated into any desired meridian and a plate of plain unsilvered glass, and criticises Gullstrand's

method of performing the same operation. But why use an expensive piece of apparatus for retinoscopy when a competent man can get perfect results with any small electric bulb or even with a bedroom candle?

T. HARRISON BUTLER.

III.—LIGHTING AND EYESIGHT.

Ferree, C. E.—The efficiency of the eye under different systems of lighting. *Ophthalmology*, July, 1914.

This is a most interesting and suggestive paper read by **Ferree** at the Fourth International Congress on School Hygiene, Buffalo, N.Y., August, 1913. It deals with investigations carried out by him as a member of the committee appointed by the American Medical Association in 1911 for the study of the effects of different systems of lighting upon the eye. The work undertaken by the author was the determination of (1) the lighting conditions that give in general the highest level or scale of visual efficiency; (2) the conditions that give the least loss of efficiency for continued work; and (3) the conditions that cause the least discomfort; and the factors taken into account were the distribution, intensity, and quality of the light in the different systems. This paper does not give the details regarding the fitting up of the different lighting systems or the method of testing the efficiency of the eye, but the author indicates that these have already been published. The systems investigated were daylight, indirect lighting, direct lighting, and semi-indirect systems. The results discussed refer chiefly to the question of loss of visual efficiency under different lighting methods. Some of the author's statements may be quoted.

". . . . the eye loses practically nothing in efficiency as the result of three or four hours' work under daylight. It loses enormously for the same period of work under the system of direct lighting selected, and almost as much under the system of semi-indirect lighting. Under the system of indirect lighting, however, the eye loses but little more than it loses in daylight. The results of these tests show also that acuity of vision as determined by the momentary judgment is higher for the same foot-candles of illumination for the daylight system than for the artificial systems, and that for the artificial systems it is highest for the indirect system, next highest for the semi-indirect system, and lowest for the direct. It will thus be seen that for all the purposes of clear seeing, whether the criterion be maximum acuity or the ability of the eye to hold its efficiency for a period of work, the best results are given by the system that gives the best distribution of light and surface brightness."

Some experiments were undertaken to ascertain the most favourable range of intensity for the four types of installation. For the semi-indirect system the most favourable intensity was 2·2 foot-candles at the point of work, and slight variations above and below this caused rapid loss of efficiency. The intensity usually recommended in lighting practice is higher than the optimum intensity found by this series of investigations. As a matter of fact, the intensity most favourable as regards loss of efficiency does not give the maximum visual acuity for momentary judgment. "High acuity and little loss of efficiency cannot be had at the same intensity" with this system of illumination. " For the direct system no intensity can be found for which the eye does not lose a very great deal in efficiency as the result of work; thus it seems that distribution is fundamental. That is, if the light is well distributed and there are no extremes of surface brightness as is the case for daylight and the indirect systems of artificial lighting, the ability of the eye to hold its efficiency is, within limits, independent of intensity. In short, the retina is itself highly accommodative or adaptive to intensity, and if the proper distribution effects are secured, the conditions are not present which cause strain and consequent loss of efficiency." In concluding this section of his report, the writer wishes to emphasize two points. "(1) Of the lighting factors which influence the welfare of the eye, what we have called the distribution of light and surface brightness is apparently fundamental. It seems to be the most important factor we have yet to deal with in our search for the conditions that give us the minimum loss of efficiency and the maximum comfort in seeing. If, for example, the light is well distributed in the field of vision and there are no extremes of surface brightness, our tests seem to indicate that the eye, so far as the problem of lighting is concerned, is practically independent of intensity. That is, when the proper distribution effects are obtained, intensities high enough to give maximum discrimination of detail may be employed without causing appreciable damage or discomfort to the eye. (2) For the kind of distribution effects given by the majority of lighting systems in use at the present time, our results show that unquestionably too much light is being used for the welfare and comfort of the eye."

Coming to the consideration of the quality of illumination, and the much discussed question of the value of the oil flame, he says: ". . . when intensity and distribution are equalised, an installation of clear carbon lamps, which gives a light comparatively rich in yellow and red, causes the eye to fall off more in efficiency as the result of three to four hours of work than an installation of clear tungsten lamps, the light from which is more nearly white," and, "The work that has been done up to this time on the relation of quality of light to seeing has been confined to visual actuity as determined by momentary judgment, and even this work, which alone can give no safe grounds at all for drawing general conclusions as to the effect of light on the welfare of the eye, shows, whenever the comparison has been made, that clear white light gives a greater acuity of seeing than lights of any of the colours. If, as has been maintained by some on the grounds of their working experience, the kerosene flame is easier on the eye than the more modern sources of illumination, the writer would be inclined, more especially in view of his results on the effect of differences in intensity on the efficiency of the eye, to ascribe the benefit, whatever there may be, to the low intrinsic brilliancy of the kerosene flame. For it may be safely said that for the kind of distribution effects we are getting from the large majority of our lighting systems, unquestionably too much light is being made for the welfare and comfort of the eye."

Readers will await with interest the further results of this useful systematic investigation of the American Committee. A. J. BALLANTYNE.

IV.—GENERAL ANÆSTHESIA IN EYE-WORK.

(1) **Whiting, Maurice H.**—Anæsthetics in eye-work. *British Medical Journal*, September 12th, 1914, p. 471.

(2) **Marshall, C. Devereux.**—Anæsthetics in eye-work. *British Medical Journal*, September 26th, 1914.

(3) **Traquair, H. M.**—Anæsthetics in eye-work. *British Medical Journal*, September 26th, 1914.

(4) **Bradburne, A. A.**—Anæsthetics in eye-work. *British Medical Journal*, October 17th, 1914.

(1) **Whiting,** of London, discusses the question of general anæsthesia in eye work. The essential conditions, in his view, are not fulfilled by ether, but are met by the employment of chloroform, either pure or in sequence with ether. During the five years 1909 to 1913 inclusive there were at the Moorfields Hospital, London, 3,092 administrations of anæsthetics. This total included chloroform, 1,687; gas and ether, 49; chloroform and ether, 1,315; gas, chloroform, and ether, 13; gas, 23; and ether, 5. During the period under review there was one death, but the author omits to state what method of anæsthesia was adopted in that particular case. During his term of office as house surgeon at Moorfields, the author administered about 450 anæsthetics in sixteen months. He nearly always gave chloroform and ether mixture. He began operations with chloroform by the drop method, soon added ether, and maintained anæsthesia at the requisite depth, using a large proportion of ether and as small a proportion of chloroform as possible. He employed a Schimmelbusch mask covered with a double layer of lint, and gave chloroform and ether from separate bottles.

Finally, Whiting protests against the corneal reflex method of testing the degree of anæsthesia in operations upon the eye.

SYDNEY STEPHENSON.

(2, 3, and 4) These communications bear upon Whiting's note upon general anæsthesia, abstracted above.

Marshall, of London, objects strongly to an anæsthetist rubbing his finger over the cornea for the purpose of ascertaining the degree of anæsthesia of a patient.

Traquair, of Edinburgh, refers to the decline of general anæsthesia in eye surgery. He shows in how few cases it is really necessary. If proper local anæsthesia be secured by injection, the enucleation of even a very tender eyeball becomes "merely the subject of a few minutes' pleasant chat with the patient."

SYDNEY STEPHENSON.

The note by **Bradburne,** of Manchester, appears to show the danger of removing cataract under inadequate general anæsthesia.

V.—VASCULAR LESIONS OF THE EYE.

(1) **Pöllot, Wilhelm.**—Scintillating scotoma and vasomotor spasm (local syncope) in both hands. [Flimmerskotom und vasomotorische Krampferscheinungen (lokale Synkope) an beiden Händen.] *Klin. Monatsbl. f. Augenheilkunde*, Dezember, 1913.

(2) **Langdon, H. Maxwell.—A case of alternating transient monocular blindness ending in complete loss of vision in the left eye.** *Trans. American Ophthalmological Society*, Vol. XIII, Part iii, 1914.

(1) The patient attended by **Pöllot**, of Darmstadt, was a woman, 52 years of age, who complained of scintillating scotoma, which at first was quite definitely confined to the left eye, but appeared later in both. She had repeated attacks of about half an hour's duration day after day, and sometimes several times in one day. These attacks were followed by some giddiness, but there was no headache. She gave, at the same time, a history of "dead fingers" occurring on exposure to the slightest cold, a tendency that had been present since childhood. She suffered from pulmonary tuberculosis, and the blood-pressure was abnormally high. An inquiry into the family history showed that in two preceding generations and one succeeding generation there was frequent occurrence of "dead fingers," scintillating scotoma, pathological blushing cyanosis of the face and hands, "heart disease," and arterio-sclerosis. This, in the author's opinion, points to a family instability of the vasomotor nervous system. This is manifested in the case under discussion by the vasomotor spasms in the fingers and the scintillating scotoma. The condition is a vasomotor neurosis related to, but not identical with, Raynaud's disease. The non-hemiopic character of the scintillating scotoma points to the neighbourhood of the chiasma as the seat of the visual disturbance. A. J. BALLANTYNE.

(2) A man, aged 40 years, whose case is reported by **Langdon**, of Philadelphia, complained of attacks of monocular blindness since early childhood, lasting from three seconds to five or six minutes, as well as of diplopia, usually lasting some thirty seconds, and coming on about once a day. The blind spells were not accompanied by headache. Nine years after he was first seen, the patient presented himself with an attack of blindness in the left eye of several hours' duration. V. = faint perception of light. Pupil 5mm., motionless to light. The optic disc showed an almost complete loss of capillarity; the retinal arteries were in parts reduced to mere threads; the retinal veins were markedly reduced in size; and the temporal portion of the retina was œdematous, with a dark spot at the macula. At the moment there appeared to be no general condition competent to account for the attack. But afterwards the patient had a complete cardiac collapse with failure of compensation and developed an aortic regurgitant murmur, œdema of the legs to the groins, and great cardiac dilatation. From these symptoms he made a good recovery, but the left eye remained blind. It should be added, that the patient's blood-pressure was 195 degrees, systolic, and that signs of slight angio-sclerosis were detected with the ophthalmoscope in the right fundus oculi.

Langdon quotes more or less analogous cases from the literature, and also gives details of experiments he made on the effect of sudden alterations of blood-pressure on the retinal blood-vessels of a dog. In passing, it may be stated that the experimental results amounted to very little, although the reduction was carried as far as 60 per cent. The author seems to think that the conditions in his case may be explained by an attack of vascular collapse in which the circulation failed of restoration, although he cannot put altogether on one side the view that the blindness may be accounted for by thrombosis taking place in the closed artery, the intima of which was presumably roughened and sclerosed. SYDNEY STEPHENSON.

VI.—THE POST-OPERATIVE COMPLICATIONS OF CATARACT EXTRACTION.

THE subject selected for discussion at the last meeting of the Ophthalmological Society of the United Kingdom (April, 1914), dealt with the complications liable to follow the extraction of cataract. The discussion was opened by papers by E. Treacher Collins and H. Herbert respectively, and these were dealt with in abstract in THE OPHTHALMOSCOPE of July last, p. 419. We may now complete the account of the discussion by abstracting the remarks of the other speakers, as reported in the XXXIVth volume of the *Transactions* of the Society.

In the first place, **Herbert,** of Nottingham, added some remarks to the account printed prior to the meeting, from which our abstract was compiled. In substance, they were as follows.—In reference to his routine maximal sublimate irrigation of the conjunctiva before operation, Herbert recommends its general adoption in this country. The immediate reaction set up by the sublimate must be looked upon as the price paid for safety. The alternative preliminary bacteriological examination of the conjunctiva, even if available, would have been merely an embarrassment to him in India, where the sublimate irrigation method grew out of the necessities of the situation. Herbert believes that cortical matter remaining after operation may directly set up "moderate" iritis. When in India he employed atropine (1 per cent.) much more frequently than is the custom in Great Britain. Nine instillations a day of the 1 per cent. solution can be kept up for a long time in many patients, with proper precautions. He advocates dilating the pupil, if possible, twenty-four hours after extraction; for then, as he remarks, "one is in advance of many of the reactions, which, when fully developed, would make dilatation of the pupil impossible." He refers to certain faint, curved, double lines which he has observed on the posterior surface of the cornea in convalescent cases, and suggests that they may be due to cracks or defects in Descemet's membrane.

Sir Anderson Critchett, of London, spoke particularly of the treatment of the more difficult cases of after-cataract. He described the procedure advocated by Noyes (*International Ophthalmological Congress*, Edinburgh), and explained how he had modified it. Above all, one must be careful to treat these cases very gently, each one of which should be dealt with on its own merits.

Browning, of London, advocated a preliminary bacteriological examination of the conjunctival sac by means of cultures on human blood-agar, inoculated from the lower fornix, by means of a swab of sterile wool mounted on a sterile stick. Separate swabs are to be taken, if necessary, from the edges of the eyelids, and from any secretion that may be pressed out from the lacrymal sac. Operation is contra-indicated if the *pneumococcus*, the *streptococcus longus*, or the *B. proteus vulgaris* be found, and also if the *S. aureus* be present in large numbers. Of the hundreds of cases examined in this way at the Moorfields Hospital, London, Browning has been able to find one case alone which became infected at or after the operation after having been given a clean bill of health from the bacteriological point of view. Sublimate, by the way, is very valuable in the attempt to render the conjunctival sac sterile and in keeping it so. Browning objects to the so-called "test dressing," as applied by some surgeons for twenty-four hours prior to the removal of cataract. He examined twenty eyes before and after being bandaged for twenty-four hours, and in every one of them found that the number of organisms was increased by the bandaging, while in several cases virulent micro-organisms appeared which were not in evidence before the eyes were occluded. Yet in only one of these cases was there any suggestion of mucus or pus on the "test dressing."

Charles Killick, of Maidstone, based his remarks mainly upon a series of 101 extractions of senile cataract performed by him in the year 1912. The more important complications were: suppuration 1, detachment of retina 3, mild iritis 10, severe iritis 1, escape of vitreous 4, and "total bad results" 6. Killick's experience of van Lint's "sliding flap operation" in complicated cases has been happy.

Claud Worth, of London, discussed hæmorrhage into the anterior chamber which, in his experience, occurred, if at all, five days after the operation. The complication appeared to occur only in cases where a conjunctival flap had been made, and was due, he thought, to some movement on the part of the patient. Another complication he was familiar with was prolapse of vitreous into the anterior chamber during discission of after-cataract. Vitreous, when in that position, never became absorbed. It might cause serious interference with sight, to say nothing of secondary glaucoma.

Ormond, of London, believes that the cause of some of the late inflammatory complications of cataract must be sought in endogenous infections. On the other hand, an infection taking place before the surgical wound has closed, or shortly after, is probably of exogenous origin. He records a couple of cases, in the first of which irido-cyclitis made its appearance in the fifth week after operation, while in the second floating vitreous opacities were noticed about a month after a "needling" for after-cataract. There was some ground for thinking that dental sepsis was responsible for the condition in both cases.

Story, of Dublin, always had a culture made from the conjunctival sac prior to operation. He also conducted a careful examination not only of the conjunctiva and lacrymal sac, but also of the mouth, nose, and teeth. He was convinced that in some instances the loss of an eye was due to the existence of pyorrhœa alveolaris. He had sometimes arrested wound infection after cataract extraction by the local application of the electro-cautery, as well as by the subconjunctival injection of mercury cyanide.

G. F. Alexander, of Scarborough, based his remarks largely upon the *technique* followed by R. H. Elliot at the Madras clinic.

R. H. Elliot, now of London, ranged over many subjects of interest in the course of his remarks. For example, he touched upon post-operative astigmatism, the disadvantages of conjunctival flaps, opacities of the cornea, capsular adhesions, suppuration, late iritis, the influence of cortical remains, glaucoma, after-cataract and its treatment, loss of vitreous, the Bamber-Herbert sublimate irrigations, intra-ocular irrigations, etc.

Landolt, of Paris, in order to avoid prolapse of the iris, nearly invariably performed the "combined" operation for cataract. He never attempted to excise iris entangled in the scar, but cauterised it and eventually covered the site with a flap of conjunctiva. With regard to the utility of the "test dressing," he was sceptical. He deprecated the employment of strong antiseptics. Before, during, and after operation he contented himself by using freely sterilised physiological serum for the purpose of mechanically cleansing the conjunctival sac. Laceration of the conjunctiva might be avoided by employing the fixation forceps devised by the speaker. Landolt also spoke of special forceps for the surgical treatment of secondary cataract.

Mackay, of Edinburgh, seldom saw posterior corneal opacities nowadays since he had replaced sublimate lotion by sterilised saline. He had not habitually employed the preliminary "test dressing," neither did he trust implicitly to bacteriological reports. If time permitted, regular douching of the conjunctiva was carried out with saline or boric lotion. Argyrol, two or three times a day for a day or so, was useful under the circumstances. It was important to pay attention to the *primae viae* before and after operation. Mackay made a point of using atropine immediately after the extraction, and in private patients he dressed the eye the same night. In threatened infection he had found a mixed staphylococcus vaccine of value.

Uhthoff, of Breslau, appears to think that notwithstanding meticulous asepsis, there must still remain a certain small percentage of primary post-operative suppuration. In his own practice this has varied from 1 per cent. to 1·5 per cent. The source lies within the patient himself. So far, he is fortunate enough never to have met with a case of expulsive hæmorrhage. Detachment of the choroid, in his experience, is common, and never has any harmful effect as regards the future of the eye. Uhthoff thinks it very important to make a large conjunctival flap. Discission is performed by him on the tenth or twelfth day after extraction. Diabetic cataracts have shown results as good as those obtained in the ordinary form of cataract.

The examination of the pathological specimens has convinced **Henderson**, of Nottingham, that in limbal incisions the subconjunctival tissue may grow down into the wound, much as in corneal incisions the surface epithelium may do. This may not be harmful, unless there happens to be an adhesion of iris or capsule or lens *débris* to the wound, when the latter may form, as it were, a scaffolding, thus allowing the proliferated tissue to grow into the anterior chamber. For several months, or even years, in such cases the optical results may continue to be all that is desired. But in time, the cellular growth begins to cicatrise. Disaster follows. The result will then depend upon circumstances. For instance, traction of the shrinking mass may produce detachment of the retina or the ciliary processes. The result is a shrunken globe. On the other hand, the traction exerted by the zonule may lead to cyclitis and glaucoma. Glaucoma may also result from occlusion of the surgical coloboma and involvement of the adjacent angle of the anterior chamber in a mass of cicatricial tissue.

Henderson sets himself to enquire into the nature of the structure that keeps the vitreous in position after the operation of "needling." The pathological examination of such an eye showed that a new hyaloid had been formed "as a sort of condensation of the surface of the vitreous structure." The new-formed hyaloid was joined with the edges of the old hyaloid, as well as with the posterior lens capsule. Henderson suggests that in cases of glaucoma following "needling," the vitreous may gain entrance into the anterior chamber, and then by a process of new hyaloid formation it may attach the iris to the vitreous or form an obstruction at the angle.

Straub, of Amsterdam, confined his remarks to the chronic inflammation that might come on in the second week after extraction. All agreed that this complication was the result of an infection. He had never seen it occur except in cases where the "toilet" after operation had not been well carried out. In the prevention of this form of mischief he attached importance to the avoidance of anything like pressure on the eye during operation. In order to prevent squeezing, Straub advocated an operation, which may be given in his own words, as follows.—"He took a stout needle, threaded with strong thread and after having injected cocaine under the skin of the lid, at the margin of the orbit, he took in muscle as well as skin, for it was with the muscle that patients squeezed." SYDNEY STEPHENSON.

VII.—THE PROGNOSIS OF INCIPIENT OPACITIES OF THE LENS.

Jessop, Walter H. — **The prognosis in incipient cortical opacities of the lens.** *Trans. Ophth. Society U.K.*, Vol. XXXIV, 1914, p. 151.

Every ophthalmic surgeon is familiar with cases of lental opacities which remain with little, if any, change over long periods of observation—where, in fact, "maturity" is never reached. The visual acuity under such circumstances has been known even to improve.

Jessop, of London, sets himself to enquire whether there are any means whereby such opacities may be distinguished from the progressive varieties. The result is a very practical communication.

He believes that the non-progressive striæ take the form of "thin, fine, generally short, straight lines; dull, dark-grey in colour by reflected, and black by transmitted light." "They are situated in the superficial layers of the cortex, and apparently all in the same layer; they are found, as a rule, between the periphery and the equator of the lens, and are often hidden by the iris; in most cases they extend posteriorly, and correspond in position to the anterior striæ." In many individuals over 70 years of age, an appearance, to which Jessop gives the name "Arcus senilis lentis," may be found, and is evidently due to senile degeneration.* In such cases the opacities form a ring around the lens, and this may be the only change present. At other times, associated with the arcus, there are isolated striæ, which extend towards and across the centre of the lens. It should be noted that these striæ, which show no tendency to coalesce with other striæ, all lie in the same layer of the lens.

Jessop has particulars of fifty instances of the foregoing kind of lental opacity, in patients whose ages have ranged from 50 to 90 years (29 females and 21 males). One of his patients, a male, *ætat* 88 years, had been told thirty years ago that he had cataract. The corrected vision is still 6/12 in each eye. Another patient, a female of 55 years, was informed five years ago that she suffered from cataract, her vision then being 6/12. Her sight is now 6/6 partly in each eye.

For cases of the kind Jessop suggests that the word "cataract" should be given up, and that some circumlocution, as "senile lenticular opacity," should be employed. Further, he expresses the opinion that a surgeon would be justified in saying that these were not cases of "cataract" if the patient asked the question.

Discussion.

After some remarks from **Sir Anderson Critchett**, of London, and **Professor Landolt**, of Paris, **J. B. Story,** of Dublin, said this was "a question not of diagnosis or of treating a disease, but of diagnosing and treating a patient." **Leslie Paton**, of London, deprecated the use of the ominous word "cataract" to designate small opacities in the lens of patients over sixty years of age. In the majority of cases they did not mean anything at all. Most

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*In 1817 Beer spoke of an annular peripheral opacity of the lens, which he likened to the arcus senilis of the cornea. The pathology of the condition has been described by Gustavo Attias (*La Clinica Oculistica*, July, 1912).

old people showed the appearance in some degree. **G. F. Alexander**, of Scarborough, spoke of congenital opacities of the lens. **Johnson Taylor,** of Norwich, agreed that the term "cataract" should be employed with caution. It was better, he thought, to tell patients with this condition that they had "a few cracks or flaws in their lenses." **George Mackay**, of Edinburgh, said that his own practice was to be frank with patients, and if he found an opacity, he drew a diagram to explain its character and effect, and when justifiable, he told the patient that it was unlikely to interfere with sight and that there was no need to attach importance to its existence. **John Rowan**, of Glasgow, in the class of case under discussion, was in the habit of telling patients that they had "specks" in the lens but he always tried to avoid applying any more precise word, such as "cataract," to the condition. **Charles Wray,** of London, never told a patient he was affected with incipient cataract until operation was imminent. In the other cases, those spoken of by Jessop, suitable glasses were prescribed, and Louis Dor's lotion was ordered. As to the latter, Wray did not meet with success once in fifteen cases, although recently he had seen at least three cases where sight had improved from 6/36 or 6/24 to 6/12 without a glass. SYDNEY STEPHENSON.

VIII.—CYCLIC AFFECTIONS OF THE THIRD NERVE.

(1) **Herbert, H.—Oculomotor paralysis with rhythmic spasm.** *Proceedings of the Royal Society of Medicine, Section of Ophthalmology*, June, 1913.

(2) **Coats, George.—Congenital partial paralysis of the oculo-motor nerve, with cyclical contraction and dilatation of the pupil.** *Trans. Ophth. Society U.K.*, Vol. XXXIV, 1914, p. 262.

(1) The case which **Herbert**, of Nottingham, reports is supplementary to that of Greeves, which was shown at the November, 1912, meeting of the Section of Ophthalmology, and the account of which will be found in abstract in THE OPHTHALMOSCOPE for September, 1913, page 549. Referring to the cases already reported and to his own (which seems to be the twelfth recorded) Herbert says: "the uniformity with which the whole nerve, and nothing but the nerve, has been affected, is suggestive rather of a basal legion."

ERNEST THOMSON.

(2) The essential facts of the case exhibited by **Coats**, of London, follow:

As a congenital defect, a girl, ten years of age, had partial paralysis of the third nerve, as evidenced by some ptosis, no upward movement of eyeball, and diminished movement inwards and downwards. The pupil showed a curious intermittent action; to wit, it contracted down to a diameter of from 2·5 mm. to 3 mm., and after this had lasted up to a minute or more, it was succeeded by a dilatation to 6 mm. or 7 mm. Lastly, after dilatation had lasted for a variable time, it was followed by contraction. This cycle was irregular as regards its duration as a whole, and also as regards the duration of its individual phases. There was an intimate relationship between the movements of the pupil, on the one hand, and impulses directed to the left internal rectus, on the other. Thus, movement of the eye towards the right induced a contraction and at the same time rendered dilatation more intermittent and less complete. On the contrary, looking towards the left caused speedy and wider dilatation of the pupil. During the stage of dilatation the pupil responded both to light and consensually. Contraction of the internal rectus and sphincter were accompanied by slight elevation of the eyelid and contraction of the ciliary muscle. L.V. = fingers at one foot.

In commenting upon the foregoing case, Coats makes some criticisms upon the Lipschitz-Salus theory of causation (see THE OPHTHALMOSCOPE, 1913, p. 549), for which the reader must be referred to the original.

SYDNEY STEPHENSON.

IX.—THE PIGMENT LAYER OF THE IRIS.

(1) **Coats, George.—Pigmented cyst lying free in the anterior chamber.** *Trans. Ophth. Society U.K.*, Vol. XXXII, Fasc. ii, p. 189, 1912.

(2) **Pooley, G. H.—Case of cyst of the iris.** *Proceedings of the Royal Society of Medicine: Section of Ophthalmology*, Vol. VI, No. ix, July, 1913.

(3) **Wiegmann, E.—Unusual condition of the iris: congenital division into two layers. (Ein eigenartiger Irisbefund: angeborene Spaltung in zwei Blätter.)** *Klin. Monatsbl. f. Augenheilkunde*, Dezember, 1913.

(4) **Weeks, John E.—A case of symmetrical occlusion of the pupils by the development of cysts and small solid masses from the uveal layer of the iris.** *Archives of Ophthalmology*, September, 1914, and *Trans. American Ophthalmological Society*, Vol. XIII, Part iii, p. 735, 1914.

(1) **Coats**, of London, found lying free in the anterior chamber of one eye of a girl, aged 19 years, a brown semi-translucent cyst, the longest diameter of which measured 1mm. to 1.5mm. It was somewhat kidney-shaped, and presented a small hilus below. There was a little pigment on the lens capsule, almost certainly representing remnants of the pupillary membrane. Some delicate opacities were present in the lens. SYDNEY STEPHENSON.

(2) **Pooley**, of Sheffield, places on record the following cases.—1. On examining the right eye of a patient (whose age is not stated), he observed a black mass in the substance of the iris, which projected backwards, and which encroached slightly upon the outer part of the pupil when the latter was fully dilated by a mydriatic. A fortnight later, Pooley noticed that the spaces in the stroma of the iris, which was of light colour, were opening up and showed distention of that part of the iris that lay immediately over the cyst. The mass was transfixed with a needle, and an incision was made through part of the wall, when the cyst collapsed. No recurrence in about three months. 2. A second case, very similar to that above described, is mentioned by Pooley; but in that case the eye was enucleated elsewhere, under the impression that it contained a sarcoma. SYDNEY STEPHENSON.

(3) **Wiegmann**, of Hildesheim, reports a case with the following congenital anomaly.—In the portion of the iris enclosed within a line running midway between the pupillary and ciliary borders there was complete absence of the anterior layer of the iris stroma. In the more peripheral portion of the iris the anterior layer was present in the form of a coarsely reticulated tissue, only loosely attached to the deeper parts by a few delicate fibres. When the sphincter contracted and expanded, this anterior layer took no part in the

movements of the iris, and when the pupil was widely dilated by a mydriatic, the anterior layer remained unaltered in position, so that a view of the fundus could be obtained through the openings in its meshwork. Thus, the iris consisted of two layers almost independent of each other. The posterior layer apparently consisted of the pigmented epithelium *plus* a thin layer of stroma.

Discussing the possible origin of this anomaly, the author favours the view of Streiff, namely, that the anterior layer of the iris stroma is developmentally continuous with the pupillary membrane, and that the abnormality in question, so far as the defect in the anterior layer is concerned, is caused by the resorption or involution of the pupillary membrane going too far and involving the iris stroma at the same time. It cannot be said whether the division of the stroma into two separate layers resulted from the splitting of a single structure or the failure of two layers to unite at the proper time.

Wiegmann points out that his case casts doubt on the correctness of Münch's theory that the iris stroma as a whole is a neuro-muscular structure, since the anterior layer of the stroma took no part in the movements of the iris, and the freedom of the pupillary reactions suggested that the neuro-muscular apparatus was intact. A. J. BALLANTYNE.

(4) **Weeks**, of New York, reports a case of "the development of cysts in the pigment layer of the iris, probably congenital in origin, and consequent on a slowly progressive irregular hyperplasia of the cells of this layer, and to œdema." He discusses the records of previous cases. The most interesting feature of the present case is the finding at the time of operation. Efforts to remove the cysts with forceps proved abortive; but by removing a portion of the iris in each eye, not only were the cysts removed, but the operator found, to his surprise, that there was an absence of posterior synechiæ, and that the occlusion of the pupil and the absence of pupillary reaction were due to the changes in the iridic tissue itself, and not to adhesions between it and the capsule. R. H. ELLIOT.

X.—CEREBRAL TUMOURS AND TOWER SKULL.

(1) **Van Schevensteen (fils).—About a case of oxycephaly with eye lesions. (A propos d'un cas d'oxycéphalie avec lésions oculaires.)** *La Clinique Ophtalmologique*, 10 avril, 1912.

(2) **Uhthoff, W.—Ophthalmic experiences and considerations on the surgery of cerebral tumours and tower skull. (The Bowman Lecture.)** *Transactions Ophthalmological Society U.K.*, 1914, Vol. XXXIV.

(3) **Holloway, T. B.—Cranial deformity associated with ocular changes.** *Transactions American Ophthalmological Society*, Vol. XIII, Part iii, p. 692, 1914.

(1) The article by **Van Schevensteen** is mainly a review, accompanied by a bibliography, on the ætiology of tower skull, with special reference to the eye symptoms. The question of operation or no operation for the relief of optic neuritis is also discussed, but the article is not suited for abstraction. ERNEST THOMSON.

(2) The extremely interesting, instructive, and suggestive Bowman Lecture by **Uhthoff**, of Breslau, is of considerable length. It is full of personal experiences, and of opinions reached after close clinical and pathological study. Every ophthalmologist should study it in the original.

Uhthoff's experiences refer to ophthalmic diagnosis in its relation to operations on tumours of the cerebrum and cerebellum, and there are special sections devoted to pituitary tumours and to tower skull.

First comes a chapter entitled "Diagnostic and Clinical Data on the Affections of the Optic Nerve in Intracranial Disease." Two tables form the basis of this chapter, one showing the percentage-incidence of bilateral choked disc in various affections of the brain, according to the author's own observations; the other, which is based, not only on his own experience but on that of others as well, deals with the percentage-incidence of eye symptoms in different brain diseases.

Uhthoff concludes that the ophthalmoscopic picture of typical choked disc indicates in the great majority of cases brain tumour. Brain tumour was present in 74·6 per cent. of the cases of bilateral choked disc. It must be remembered, however, that, although rare (0·3 per cent.), congenital pseudo-neuritis may appear as choked disc accompanied by violent cerebral symptoms. Such symptoms may prove, *e.g.*, to be hysterical. In the differential diagnosis as to whether the choked disc is congenital or acquired, one must take into consideration the presence or absence of hæmorrhages, etc., and recollect the appearance of hyaline bodies in the papilla. Bilateral "non-prominent" optic neuritis was observed by the author in only 6·5 per cent. of brain tumours—that is, exclusive of those cases where choked disc eventually came on. While bilateral choked disc and optic neuritis is the rule in intracranial tumours, these conditions are of little use in localization. From the accompanying symptoms (hemianopia, hemiplegia, etc.) it is often possible to draw diagnostic conclusions.

The author discusses fully the question of the diagnostic value and occurrence of *unilateral* choked disc, optic neuritis, and optic atrophy in intracranial diseases. It is here only possible to give a few of the points which he makes. In cases of brain tumour, unilateral choked disc was observed in 4·1 per cent. (66 per cent. ipsolateral). Non-prominent optic neuritis was very rarely seen in brain tumour; it was never seen at all in brain abscess, hydrocephalus, or tower skull; it occurred in a considerable percentage of cases of cerebral syphilis.

Uhthoff thinks that too much has been made by some surgeons of homolaterality of the lesion as a symptom. "It is by no means always possible in tumour of the cerebrum to draw the conclusion from unilateral choked disc that the seat of the tumour is situated on the same side; only in 56 per cent. of the cases in question was the brain lesion on the same side as the choked disc.

In tumours of the cerebellum the statistics in question show that the tumour is just as often on the same side as the choked disc as on the opposite side.

Bilateral choked disc or optic neuritis, but with more prominence in one eye, was found to correspond with a situation of the cerebral tumour on the same side in 73 per cent. of cases.

A tumour in the anterior parts of the cerebrum seems more likely to produce a unilateral papillitis than one situated posteriorly. This is to be explained by greater pressure on the optic nerve on the side of the tumour. "More pronounced retinal hæmorrhage on one side accompanied by unilateral choked disc, the result of cerebral tumour, does not justify the conclusion that the seat of the tumour is on the same side (Horsley); in our material the opposite was nearly as often the case."

Brain abscess is next referred to. For the localisation of this, unilateral choked disc is of greater importance than in tumour. It cannot be set down as an invariable rule that unilateral choked disc must be on the same side as cerebral abscess, but this is much oftener the case than in brain tumour. The same thing holds for bilateral choked disc with greater prominence on one side. With regard to non-prominent optic neuritis in abscess, the following statement is made—" On the whole, unilateral optic neuritis or hyperæmia of the papilla and unilateral greater development of the optic neuritis, indicate a situation of the abscess on the same side."

The author is very emphatic as to the urgency of operation in cases of brain abscess which show choked disc or optic neuritis. In 80 per cent. of such cases, the abscess is connected with the ear.

The second chapter (the word "chapter" is used by the reviewer for convenience) deals with the clinical symptoms of choked disc. As is well known, the typical picture of choked disc can exist with complete preservation of sight. In the author's series, this occurred in 29 per cent. of his cases and of these some showed no considerable disturbance of vision for over a year. But if the sight does become manifestly defective, the loss generally progresses rapidly if surgical intervention be not undertaken. It is therefore dangerous to postpone operation too long. A postponement of operation is justifiable if the sight and visual field can be kept under observation and while the vision is intact and the field full. The possibility of spontaneous recovery must be remembered. This took place in about 5 per cent. of the cases in which choked disc was accompanied by all the symptoms that indicate brain tumour.

The author goes at length into the various disturbances of the field of vision, giving percentages. Enlargement of the blind-spot was an almost constant anomaly of the field in choked disc, yet it may be absent in quite recent cases. If a further restriction of the field took place, this occurred mostly under the picture of a peripheral, more or less concentric, contraction, so that this form of deterioration of the field of vision is rather characteristic of choked disc. Homonymous hemianopia was always regarded as having a direct localising value. On the whole, says Uhthoff, homonymous hemianopia without macular diverticulum, indicates a basal lesion, or at least a localization of the tumour in front of the entrance into the occipital lobe of the optic radiation of Gratiolet.

The author says that he does not quite agree with the views of the shifting and interlacing of the colour fields held by such observers as Cushing, Sachs, and Bordley. In cases of intracranial disease, when sight is still good and the fundus normal, he does not think it right from such an anomaly of the colour sensation to draw the conclusion that choked disc will ensue.

In the third, fourth, and fifth chapters are discussed the " Diagnostic Indications derived from Disturbances of the Ocular Muscles in Brain Tumour," and the " Diagnostic Importance of Unilateral Exopthalmos in Intracranial Disease." Disturbances of the ocular muscles, Uhthoff says, are of far less importance than intra-ocular changes in the diagnosis and localisation of brain tumour, and as a guide to operation. The chapter on the diagnostic importance of unilateral exopthalmos in intracranial diseases concerns the brain surgeon very particularly, but it can hardly be abstracted with advantage.

The sixth chapter deals with operations on brain tumours. Lumbar puncture, Neisser-Pollack brain puncture, corpus callosum puncture (Anton and v. Bramann), palliative trephining, and extirpation of brain tumour are all discussed. Uhthoff regards the second and third as less dangerous than the first, and considers the second to be comparatively free from danger. In about 25 per cent. of the cases this operation (brain puncture) proved advantageous in that the anatomical examination of the thin cylinder of cerebral substance, obtained during the operation, decided the nature of the tumour. It may properly be performed as a first intervention, since it is relatively free from danger, affords relief to the symptoms, and furnishes diagnostic indications. In certain cases which turn out to be not brain tumour but, say, hydrocephalus internus, this simple decompressive operation may be of lasting benefit, and may even effect a cure. Of corpus callosum puncture the author has not had much personal experience, but refers to the work of Anton and v. Bramann. If this operation has no effect upon the choked disc, a further operation can be undertaken under more favourable conditions of intracranial pressure. He (Uhthoff) considers it the least dangerous procedure next to the Neisser-Pollack brain puncture. Palliative trephining and extirpation of the tumour are discussed statistically. These statistics do not make exhilarating reading. We must leave our readers to digest them for themselves, and be content to quote the final remark that "among our own material we have obtained particularly favourable results after operation (extirpation) in cases of tumour of the ascending parietal convolution, and of tumour growing into the brain from the dura and only displacing the cerebral substance."

In the seventh chapter the results of the operative work of other writers is submitted to statistical enquiry.

The remaining three chapters are really separate articles dealing respectively with hypophysis tumours and with tower skull. The reviewer does not think he could make an intelligible abstract of them, and prefers to leave them for study in the original. One remark of the author may, however, be transcribed :—" Basing my belief upon an analysis of *post-mortem* material, I am of opinion that at least three-quarters of the hypophysis tumours with acromegaly or other trophic disturbances are of a benign, non-infiltrating nature—hypertrophy of the hypohysis, adenoma, struma, cystoid tumours, and even perhaps the squamous epithelial tumours of Erdheim. They grow slowly, often very slowly, and, according to my belief, it occasionally takes decades before they lead to serious visual disturbances or other important trophic changes. Such hypophysis affections, in my opinion, may begin in early childhood, and not display their deleterious affects upon the organ of sight until later in life." ERNEST THOMSON.

(3) **Holloway**, of Philadelphia, describes a couple of cases in which cranial deformities were associated with post-papillitic atrophy of the optic disc and with other ocular changes, and, in doing so, pays particular attention to the X-ray findings. It appears that the chief changes brought out by X-ray studies in cases of this character are :—(1) " The flattening of the orbits due to pressure of the brain against the great wing of the sphenoid, so that instead of forming the outer wall of the orbit, it tends to form the posterior wall. (2) The middle fossa is usually deepened, and in certain cases distinct alterations have been found in the pituitary fossa. (3) The inner table in part, or throughout its extent, shows characteristic markings referred to as ' digital impressions,' attributed to impressions from the brain convolutions by the majority of observers."

The author goes on to discuss the various theories advanced to explain the synostosis generally believed to be the cause of oxycephaly, and the views that have been held as to the origin of the neuritis or atrophy so often found along with tower skull. Finally, he speaks of the question of surgical interference in these cases, describes Schloffer's "canal operation," and expresses himself in favour of operation if the patient be seen in the stage of "choked disc." On the other hand, he deprecates anything of the sort when faced with an optic atrophy of long standing. SYDNEY STEPHENSON.

XI.—PATHOLOGY.

Fifth Notice.)

(1) **Bachstez.—Cicatrices after sclerectomy and after trephining of the sclera. (Narben nach Sklerektomie und Trepanation der Sklera.)** *Zeitschrift für Augenheilkunde*, Januar, 1914.

(2) **Tooke, Frederick.—The pathology of the corneal section and its complications in cataract extraction.** *Trans. Amer. Ophth. Society*, Vol. XIII, Part iii, 1914, p. 742.

(1) **Bachstez**, of Vienna, presents us with the results of the microscopica examination of three eyes which had been operated upon for glaucoma. A Lagrange sclerectomy had been performed upon one, an Elliot trephining upon another, and a double trephining upon the third.

The Lagrange operation left a large cavity in the sclera, which communicated freely with the anterior chamber by a long canal. The conjunctiva was œdematous but not raised up. The specimen was obtained fifteen days after the operation, the patient dying of pneumonia.

Another eye was removed sixty days after an Elliot's trephining operation. The scleral defect was filled with cicatricial tissue rich in cells. Delicate canals, which were lined with endothelium, were present in this tissue. The conjunctiva showed overgrowth of connective tissue and was somewhat œdematous. Schlemm's canal had been freely opened by the trephining.

The last eye had been trephined three times, and in each case the wound had cicatrized firmly and the operation was a failure.

The plate attached to the communication shows a section through the site of one of these unsuccessful operations. A similar section was shown by Elliot himself at the Oxford Ophthalmological Congress in 1913, and illustrates a condition which unfortunately not infrequently follows these operations, whether performed with the trephine or the punch. The plate also illustrates the successful Lagrange fistula.

The author states that very few of these cases have been examined microscopically, and mentions a few examples from German literature. He makes no reference to several cases which have been published in England and shown at the last Oxford Congress and elsewhere.

T. Harrison Butler.

(2) **Tooke**, of Montreal, has a long article, illustrated with seven beautiful plates, dealing with the section of the cornea made in the operation of cataract extraction, and with allied questions. The work is based upon *post-mortem* material, experiments upon animals, and, lastly, upon the pathological examination of eyes enucleated by reason of complications after the operation of cataract.

The Corneal Section.

The corneal section is filled with clot, made up of lymph corpuscles and erythrocytes entangled in fibrin. This clot serves not only to breach the incision but also to furnish the initial elements necessary to the preliminary efforts at repair. The first manifestation of healing takes place through the middle or posterior fibres of the substantia propria of the cornea—the parts, that is to say, first brought into contact with the escaping aqueous humour. With the apposition of these central fibres, a triangular gap appears both in the superficial and the deeper portion of the section. The anterior or corneal gap is speedily covered by an overgrowth, as well as by a downgrowth, of the epithelium (Fig. 1). It is possible, as supposed by Ranvier, that the presence of the epithelial cells in the wound is purely mechanical, and this appears to be borne out by Neese's observation, namely, that mitosis is not seen until about twenty-four hours after the wound has been inflicted. It has been thought that before mitosis is observed the cells show definite amœba-like and progressive motion, so that (without actual multiplication) one or two layers may encroach over the edge of the wound (Peters). The posterior gap—*i e.*, that lying behind the central healed fibres of the substantia propria—becomes filled by an ingrowth of the endothelium, allowed to creep

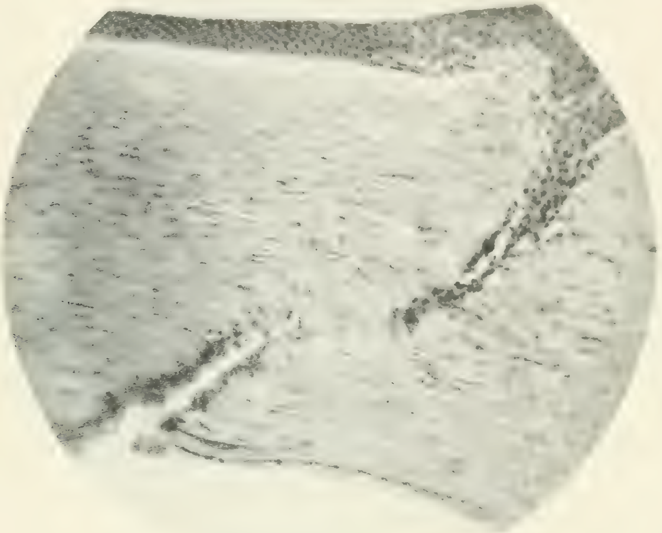

Fig. 1.—Corneal section seven days after cataract extraction. Puckering of corneal epithelium, with ingress of epithelium into anterior triangular space formed by wound. Direct healing of central corneal lamellæ. Ingress of endothelial cells into posterior triangular space with non-union of Descemet's membrane.

into the wound by retraction of Descemet's membrane and separation of its severed ends. Tooke regards the ingrowth of the endothelium as an hindrance rather than as an aid to the ultimate healing of the wound by scar tissue (Fig. 2) He has specimens showing that on occasion the endothelial cells not only cover the cut ends of Descemet's membrane and line the gap, but burrow over the interrupted hyaloid tissue, and proliferate between the latter and the innermost layers of the substantia propria (Fig. 3). Weinstein found amorphous masses, staining with hæmatoxylin, covering the surface of Descemet's membrane two days after a corneal section, and on the third day spindle cells were found along the posterior surface of the wound. According to Weinstein, these cells proliferated and formed a band which tended to unite the severed ends of Descemet's membrane. These masses and cells are probably of endothelial origin. Tooke agrees with other authorities that the cut ends of Descemet's membrane never unite. But that is not to say that regeneration of similar tissue may not take place from the endothelial cells and possibly from the innermost layer of the corneal parenchyma.

In short, from observations carried out on animals, as well as from the examination of post-operative specimens, Tooke maintains that "in sections of the cornea a direct union of the cut ends of Descemet's membrane does not occur." Several other things point in the same direction. For example, it stands to reason that the inherent elasticity of the completely incised membrane draws the cut ends apart, while such an incised membrane, when not supported below, has a tendency to twist or to twirl or even in some cases actually to break off. Again, the endothelium which covers the cut ends of the membrane opposes a barrier to union by connective tissue and prevents their union, even though their ends are not approximated.

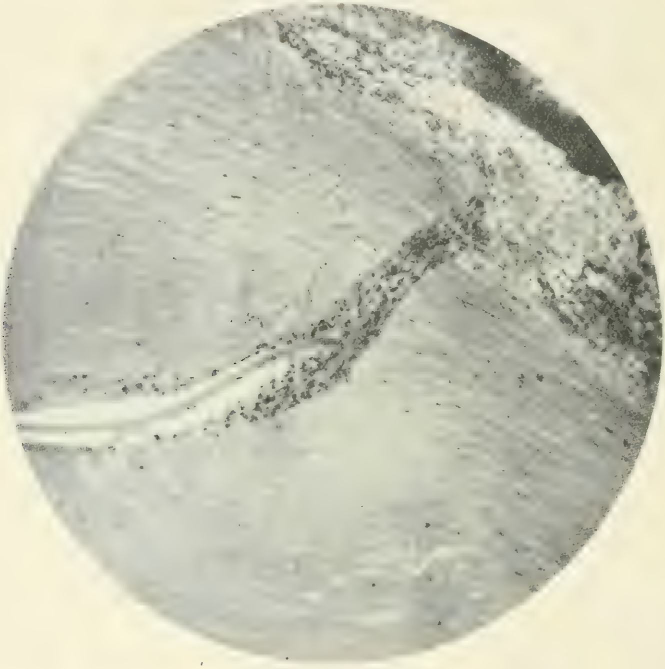

Fig. 2.—Section of cornea twelve days following operation. A very much weakened globe resulting from ingress of subconjunctival tissue cells into upper third of wound. The rest of the incision occupied by an involuted fragment of Descemet's membrane. Lower part of incision lined with endothelial cells. Absolutely no fibrous union in cornea. Distinct advantage of conjunctival flap in this case.

The Pathology of the Conjunctival Flap in Cataract extraction.

Tooke recapitulates the advantages of a conjunctival flap as follows:—(1) It acts as a mechanical covering for the wound, preventing the access both of air and of conjunctival exudation; (2) it renders the breaking-down of the incision less likely to occur; (3) the cutting of numerous small capillaries implies that the entrance of the wound some distance away is sealed by the exuded plasma and fibrin; and (4) it inhibits infection and promotes repair by an added determination of leucocytes and erythrocytes (Fig. 2). To these the author adds another advantage, *viz.*, that union of the substantia propria of the cornea is aided by ingress of the cells of the submucosa and those cells of the new connective tissue type. Extensions from the subconjunctival tissue cells, associated with new blood vessels, may frequently be seen in the anterior gap left in the cornea (Figs 1 and 2). These several features have been demonstrated by Tooke in the conjunctival flap of a rabbit at the end of two days, at which time organized union and newly-formed connective tissue were present in the flap.

Tooke holds that the plan of making the conjunctival flap down to its extreme corneal limitation is responsible for late infection in the operation of trephining for glaucoma. The nearer we get to the limbus, he remarks, the thinner does the flap become, and when at the corneo-scleral margin "it may be regarded at times to consist of little more than the epithelial elements." He thinks it would be simple for certain forms of bacteria to infect the anterior chamber when the supporting cells of the filtration bleb had been much reduced in the preliminary dissection. Moreover, pressure would be exerted on the cells lining the cyst by the escaping aqueous, so that the former would be reduced from a cuboid to a more or less flattened or squamous type. Then, we must not lose sight of the fact that the infective element may lie well beneath the epithelial cells of the conjunctiva, in the subconjunctival tissue (Morax).

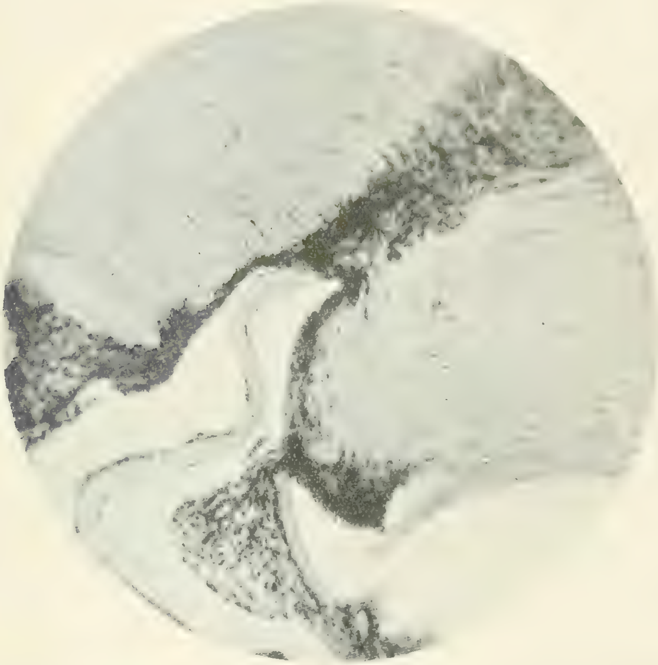

Fig. 3.—Corneal section one month after operation. Well developed healing of central corneal lamellæ. Ingress of lens capsule into posterior triangle which has prevented healing. Healing also retarded by ingress of endothelial cells. Burrowing of endothelium between Descemet's membrane and innermost fibres of corneal stroma. Fragmentation of Descemet's membrane.

Prolapse of Iris, etc.

After a section dealing with "Septic wounds of the Cornea," the author considers in succession prolapse of the (*a*) iris, (*b*) lens fibres and capsule, and (*c*) ciliary body.

(*a*) Iris may knuckle into the wound either at its pupillary margin or at any more distant part. An anterior synechia is formed not so much from the intruding membrane as from the exudation of lymph which forms between the iris and the adjacent tissue of the cornea. When the incision heals, the included iris is replaced by the elements of scar tissue The angle between the iris and Descemet's membrane may be filled by long spindle cells, with rod-shaped nuclei. A hyaline membrane may be formed from the endothelium which covers the anterior surface of the iris. A greyish or a brownish prominence may appear upon the surface of the cornea in prolapse of the iris, and, as in the case of anterior synechia, the iris may become fused with the edges of the wound. Any part of the protruding iris which presents above the surface of the cornea becomes covered with an exudation of lymph, over which the epithelial cells rapidly proliferate. These epithelial cells take the form of several layers, much as one observes in the epithelium covering the cornea. These cells bridge over the aperture occupied by the iris, extending from one lip to the other of the corneal incision. The knuckle of the iris is usually flattened by contraction of the new connective tissue elements, and a firm grey scar as a rule results. But in a proportion of cases the cicatrix formed in this way yields before the intra-ocular pressure, and a cystoid cicatrix is thereby constituted, composed of epithelial or endothelial scar tissue, together with the pigment cells of the iris. Irritation of the ciliary body is one danger attendant upon prolapse of iris. By some writers this is held responsible for sympathetic ophthalmitis, while others fear a possible bacterial ingress to the prolapse.

(*b*) That the inclusion of lens matter, as well as the intrusion of the vitreous humour, plays a *rôle* in delaying the primary union of the incised cornea is well known to everybody. The period of delay necessitated by the absorption or cicatrisation of these foreign bodies is one fraught with danger, owing to the possibilities of infection. The danger may be even a more positive one as regards the lens capsule, since its curled and irregular inclusion may occupy an uneven position in the section and thus produce evident irritative reaction. Inflammation may creep along the course of the incarcerated capsule and set up generalized intra-ocular infection. Non-union in the case of prolapse of the vitreous may be due to two causes. In the first place, the *membrana vitrea* may be included between the lips of the wound, and act in much the same way of preventing union as does the capsule of the lens or Descemet's membrane. Secondly, the reason may be sought in the different specific gravity of the vitreous and the other fluids, as aqueous, blood, and lymph, which take part in the healing process. Considerable importance is attached by Tooke to blood, effused as the result of the operation, in promoting healing when the vitreous is prolapsed.

(*c*) Under certain circumstances it is possible for the anterior ciliary processes to become entangled in the posterior parts of the lips of the cataract incision. This unfortunate state of things, says Tooke, produces not only delay in the process of healing, but actually excites very definite sympathetic dangers.

In some cases of cataract extraction the edges of the incision may over-ride, and under such circumstances the corneal epithelium may line the wound or extend into the anterior chamber. The whole of the anterior chamber may possibly become lined by the epithelium ("cyst of the anterior chamber"). The process is a rapid one. These incisions occasionally heal in places, while delay or non-union occurs at other points occupied by implanted epithelial cells. The microscopic appearance under such conditions may be that of a solid downgrowth of tubes or of cystic spaces.

Striate Keratitis.

Striate keratitis in a certain portion of those operated on for cataract appears about 24 hours after operation, and usually disappears ten or twelve days later, without prejudicing in any way the processes of healing. Tooke speculates as to the cause or causes of these curious changes, and without reaching any precise conclusion in that direction, suggests that it may possibly be connected with endothelial changes brought on by the various kinds of irrigator now in use. This hypothesis, however, was not borne out as the result of his experiments on rabbits, and so he now suggests that age may be a factor in the matter.

The communication concludes with a few remarks upon the influence of cocaine and of mercury bichloride upon the cornea. SYDNEY STEPHENSON.

XII.—SPOROTRICHOSIS.

(*Third Notice.*)

(1) **Wilder, William H., and McCullough, Clifford P.—Sporotrichosis of the eye.** *Jour. Amer. Med. Association*, April 11th, 1914.

(2) **Bedell, Arthur J.—A case of chronic sporotrichosis of the eye.** *Trans. Amer. Ophth. Society*, Vol. XIII, Part iii, 1914, p. 720.

(3) **Gougerot, H.—The sporotrichoses: what every practitioner ought to know.** *Medical Press and Circular*, October 7th, 1914.

(1) The case of sporotrichosis of the conjunctiva by Wilder has already been abstracted in our columns (*see* May, 1914, p. 299). The present report by **Wilder** and **McCullough,** of Chicago, after sketching the history of the affection, and recapitulating the facts about the patient, goes at some length into the various tests made to identify the fungus, and ends by briefly resuming the cases so far reported of infection of the eye or its adnexa with sporothrix. The communication is well worth reading in the original.

SYDNEY STEPHENSON.

(2) **Bedell**, of Albany, N.Y., reports the third instance of ocular sporotrichosis so far met with in the United States.

A male patient, aged 49 years, had been affected with a muco-purulent discharge from the right eye for upwards of two years. There were many discrete follicles and numerous ulcerating points (1 mm.) in the palpebral conjunctiva, together with a granulation (7 mm. by 5 mm. by 2 mm.) towards the nasal edge of the right upper lid, beyond the free margin of which it projected some 2 mm. The "caruncular fold" was three times its usual thickness. Both puncta were prominent and dilated, and the inner canthus was flooded with yellow and somewhat tenacious muco-pus. A limited portion (4 mm.) of the corneal epithelium was absent from the nasal side.

The diagnosis of sporotrichosis was deemed probable on clinical grounds. Cultures were taken, and the conjunctival granulation was removed for pathological examination. A Gram-negative and a non-acid fast organism was obtained upon various media, more especially upon the sugar-agars. Although it conformed with Link's definition of the botanic group, *Sporotrichum*, yet it showed marked cultural differences as compared with any of the described varieties. It is still under study as regards its pathogenicity for animals, etc.

The excised conjunctival granulation was covered with stratified squamous epithelium, and showed evidences of acute and chronic inflammation.

Some six weeks after the patient was first seen by Bedell, five firm brown concretions were removed from the lacrymal canaliculi. The *Sporotrichum* was found in culture after crushing these concretions, which ranged in size from 1.5 mm. in diameter to an oval 2 mm. by 6 mm.

Potassium iodide (1 to 2 grammes three times a day) was given internally, and the entire conjunctival surface was painted once daily with tincture of iodine. Recovery was complete fifty-four days after the patient was first seen by the author.

A bibliography concludes Bedell's communication.

SYDNEY STEPHENSON.

(3) As now well-known, sporotrichosis may affect several parts of the eye and its appendages. In these circumstances an abstract of a communication by **H. Gougerot**, of Paris, dealing with the broad aspects of the affection, may not be devoid of interest to eye surgeons.

There are many varieties of sporotrichum (probably at least one hundred), but, so far as is known, some eight only are pathogenic as regards man or animals, and of these the one most frequently met with is the *S. Beurmani.* Sporotrichosis may be contracted in various ways, as, for example, by the ingestion of uncooked vegetables, or by inoculation from scratches by thorns or from knives used for peeling potatoes. The contagion may also be conveyed by contaminated animals. Instances have been known where the conjunctiva has been accidentally inoculated whilst working with cultures of *Sporotrichum.* The malady may attack practically all the tissues, and present almost any clinical aspect. As regards course, it may be acute, sub-acute, or chronic. The gummatous is by far and away the commonest form. The types most often met with are enumerated by Gougerot as follows :—

(1) Subcutaneous gummata disseminated all over the body, varying in number from six to a hundred or more ; these may be small and hard, medium and soft, or breaking-down with abscess formation. They may be deeply seated, ultimately involving the skin with ulceration.

(2) We may get infiltrating gummata of the skin simulating cancer, warty patches simulating lupus, epidermitis simulating ringworm, blepharitis, osteitis, laryngitis, etc.

(3) A chancre at the site of inoculation, ulcerous, vegetative or warty, or, it may be, in the form of gummatous lymphangitis, involving or not the glands. In some cases the adenitis dominates the scene.

(4) Deep isolated lesions : osteitis, arthritis, synovitis, pyelonephritis, etc.

(5) Isolated lesions of the mucosæ, ulceration of the pharynx simulating tuberculosis, lingual tumefaction simulating cancer, laryngitis, conjunctivitis, ophthalmia, keratitis, etc.

In all cases which suggest syphilis, tuberculosis, or some chronic pyogenous infection, such as Parinaud's conjunctivitis, it is a good rule to bear the possibility of sporotrichosis in mind. It is often possible to diagnose the affection clinically on the strength of certain signs, given below, the importance of which has been established by Gougerot on many occasions.—A large number of lesions or the extreme severity of any one lesion contrasting with the excellent state of the general health. Onset of the lesions in the form of an indurated nodule slowly degenerating into an abscess. Partial, cupuliform softening ulcers, usually narrow, enlarging secondarily. Irregular livid edges, almost always undermined, with pockets in which pus accumulates. Contrast between the small area of the ulcer and the extent of breaking-down gumma. The co-existence of several apertures or two contiguous ulcers adjacent to the same gumma and the persistence between the two ulcers of a slender bridge of bluish skin. The pus is viscid or the serous exudation citron-yellow. In spite of the persistence of the abscess, cicatrisation takes place beneath the thinned skin. The cicatrices are flat, either narrow or wide, supple, with uneven edges often dentated with imperfectly adherent lappets of skin with a brownish halo. Then, too, there is rarely any glandular enlargement. The lesions retrogress under the influence of the iodine treatment, but recur if this treatment be suspended too soon. Lastly, the extraordinary mixture of different lesions: tuberculoid, syphiloid, ecthymatous, etc.

The positive diagnosis of sporotrichosis is made by cultivation of the fungus on glucose-agar or by recourse to the serum test. The simplicity of the first-named is such that there can be no excuse for neglecting to adopt it, particularly if Beurmann and Gougerot's procedure be followed. The medium is peptonised glucose-agar, incubation is carried out at room temperature, and it is even unnecessary to resort to a microscopical examination, since so characteristic are the appearances that the naked eye aspect of the culture is enough for recognition. Three tubes are inoculated, each with one-half to one cubic centimetre of pus, and left at the temperature of the room. In the case of closed lesions, such as synovitis, the pus is obtained by aspiration. Colonies of *Sporotrichum* make their appearance between the fourth and the twelfth day, and at first they are brown and then of chocolate colour. They can be recognised by their colour and wrinkling, as well as by the brownish halo that surrounds them. Nobody who has once seen a typical culture of the *Sporotrichum* will have any difficulty in again identifying it. If an earlier diagnosis be advisable, such may be made towards the close of the second day after inoculation, by examining with a lower power microscope the colonies formed between the tube and the medium. The detection of thread-like filaments renders diagnosis certain. If the intention be to adopt this early diagnosis, we pour pus from the lesion down the dry walls of the culture-tube.

SYDNEY STEPHENSON.

XIII.—OPERATIONS.

30.—The Lacrymal Passages.

(1) **Kuhnt.—Upon the treatment of diseases of the lacrymal duct, with especial reference to chronic types. (Ueber die Behandlung der Tränenschlauchleiden mit besonderer Berücksichtigung der inveterierten Formen.)** *Zeitschrift für Augenheilkunde*, November, 1913.

(2) **Pooley, G. H.—Some technical points which increase efficiency of the operation for excision of the lacrimal sac.** *Ophthalmic Review*, November, 1913.

(3) **Graham, Cecil and Paton, Leslie.—Two cases to illustrate operation for complete lacrymal obstruction by West's method (Halle's modification).** *Trans. Ophth. Society U.K.*, Vol. XXXIV, 1914, p. 102.

(4) **McGillivray, James.—Chronic dacryocystitis: the intranasal operation, with case report.** *Canada Lancet*, September, 1914.

(5) **Dorrell, E. Arthur.**—**On lacrymal obstruction.** *Medical Press and Circular*, September 16th, 1914.

(1) **Kuhnt**, of Bonn, read a paper upon this important subject to the Ophthalmological Section of the Congress of German Medical Men in Vienna on the 23rd of September, 1913.

He stated that the main reason why the treatment of lacrymal disease was so unsatisfactory was because we have regarded it as a primary affection, whereas it is really always a secondary condition. It follows that simple probing must be useless; in fact, it is generally harmful. Secondary disease of the lacrymal duct is possible (1) from general disease of the body; (2) from the conjunctival sac; (3) from the nose; (4) from the surrounding tissues, especially the periosteum and bone in the lacrymal groove and surrounding the duct.

General diseases which affect the lacrymal passages are tuberculosis, syphilis, and many acute and chronic septic diseases.

The conjunctivæ, if the mucous membrane of the lacrymal passages be healthy, have only a slight and exceptional influence. It is astonishing how rarely the sac becomes infected in acute blennorrhœa and diphtheria. One can almost surmise that the secretion from the mucous membrane of the sac inhibits the development of organisms, and that their toxic action causes swelling of the canaliculi and mechanically excludes the micro-organisms.

Diseases of the nose have, on the contrary, great influence upon the ætiology of lacrymal affections. We must differentiate between disease of the nasal mucous membrane, including deformities of the inferior meatus and the inferior turbinal, and diseases of the anterior nasal sinuses.

Recurrent coryza, hypertrophic rhinitis, and alterations in the size and position of the inferior turbinal, are causes of lacrymal disease; but sinusitis, especially the chronic type, is far more important. Brunzlow, working in the Bonn clinic, found definite sinus disease in 63·5 per cent. of all the cases he examined, in 11·3 per cent. there was a suspicion of sinusitis, and only in 3 per cent. was the nose normal. The antrum of Highmore and the ethmoid cells were most frequently affected. Treatment must not be of a routine nature, but must be intelligently adapted to each individual case. The nose must be carefully examined by an expert rhinologist with the help of good skiagrams. The condition found in many extirpated sacs shows that it is impossible to hope that conservative methods will cure all cases; many of them can only be permanently relieved by removal of the sac, but in a certain proportion of the cases nasal treatment, followed by *lavage*, will be successful. Probing with metal sounds is absolutely contraindicated in all cases; such a procedure causes erosions of the mucous membrane, and only aggravates the condition. If *lavage* fails, it is permissible to use a thin fish bone probe, well lubricated. If adhesions be present, Kuhnt slits up the canaliculus even into the sac, and he then uses the fish bone probe daily. The introduction of a silk thread, as recommended by Stahl, may prove very useful, and can do no harm. If these means fail, we must either excise the sac or try to form a fresh passage between the sac and the nose, using the procedures of Toti, West, Polyák, or van Eicken. Kuhnt thinks that all these operations are still "on trial," but he has obtained good results from Toti's operation.

Excision of the sac is indicated:

1. In tuberculous and lupoid dacryocystitis and, in the presence of ozœna.
2. In cases of advanced changes in the mucous membrane, such as polypoid degeneration.
3. When the sac is very much shrunken, as in advanced trachoma.

4. All cases when the surrounding bone is diseased.
5. When an operation is to be performed upon the globe.

Polyák's and West's operations may be undertaken when there are tight strictures, but the passages are reasonably normal.

Van Eicken's operation is suitable to cases when the antrum is diseased.

Toti's method is useful in all other cases of obstinate dacryocystitis, when at least one canaliculus and punctum are normal.

T. HARRISON BUTLER.

(2) In order to avoid the possibility of regurgitation of fluid by pressure over the site of operation, which is occasionally seen, and is probably due to the retention of the canaliculi and a small part of the sac adjoining, **Pooley**, of Sheffield, divides the canaliculi close to the puncta when excising the sac, and before closing the wound, inserts a catgut suture through the orbicularis, tendo oculi, and the periosteum on the nasal surface.

A. H. PAYAN DAWNAY.

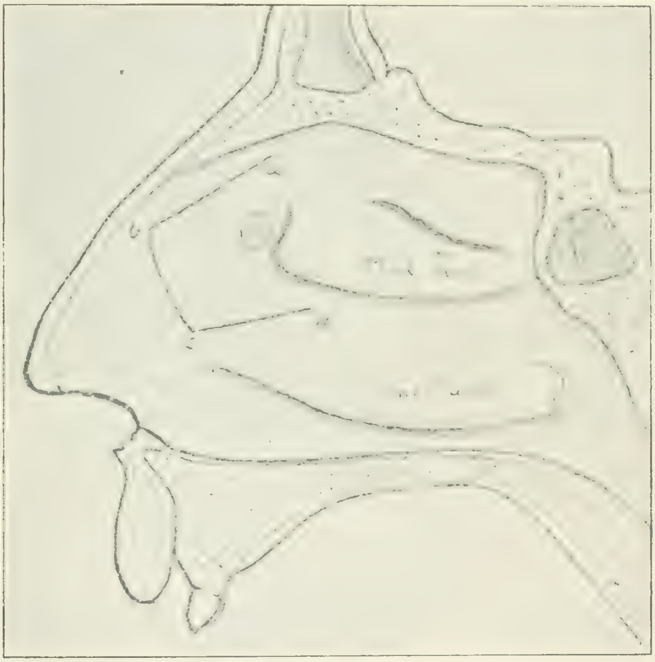

FIG. 1.

a, *b*, *c*, *d*. Incisions marking out the flap, after previously removing small areas of mucous membrane in front of middle turbinal.

(3) The operation described by **Graham** and **Paton**, of London, is as follows:—

"The operation consists of removal of a small circular piece of mucous membrane from the outer wall of the nose opposite the anterior end of the middle turbinal, a rectangular flap of membrane including this hole is then turned backwards and upwards, and the bone forming the inner wall of the tear-sac is chiselled away. A probe is passed into the tear-sac through the lower canaliculus and pushes the wall of the sac through the bony opening. This bulge is then snipped away. When the flap of nasal mucous membrane is put back into position, the holes in the sac-wall, the bone, and the nasal membrane coincide. A strand of strong gut or a piece of thin lead wire is passed from the lower canaliculus through the new passage and out of the nose to help to keep the flaps in position and opposite one another while healing takes place. The nose is plugged for the first two or three days."

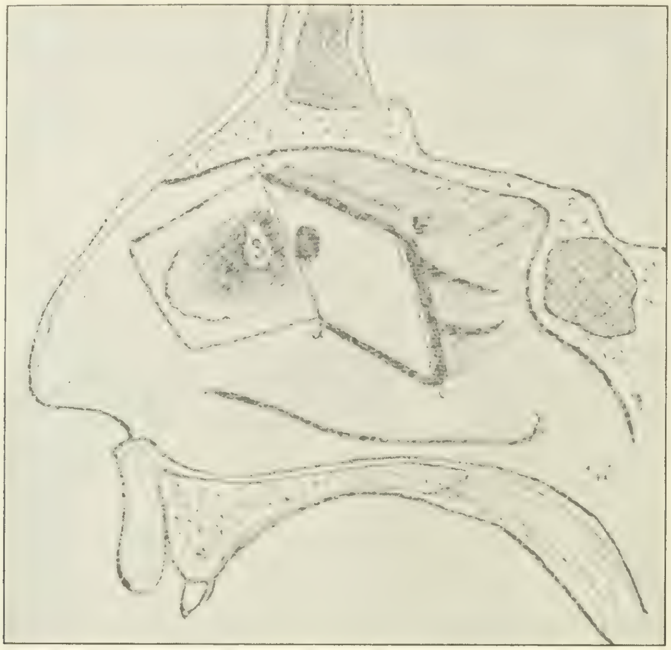

Fig. 2.

Flap reflected showing button-hole near its attached border. *S.* Lacrymal sac exposed in the groove which has been chiselled in frontal progress of maxilla and lacrymal bones.

(4) This brief communication by **McGillivray,** of Winnipeg, is based upon a single case of chronic dacryocystitis in which good results followed the performance of J. M. West's operation, as modified by Max Hallé. No new points appear. SYDNEY STEPHENSON.

(5) After describing the treatment of lacrymal obstruction by the syringe and the probe, **Dorrell,** of London, gives the indications for removal of the lacrymal sac. SYDNEY STEPHENSON.

31.—Substitutes for Enucleation.

(1) **Wicherkiewicz.—On the implantation of skin into Tenon's capsule after enucleation. (Sur l'implantation de la peau dans la capsule de Tenon après l'énucléation.)** *Bulletin de la Société Belge d'Ophtalmologie*, août, 1913.

(2) **Spratt, Charles Nelson.**—The implantation of fat in Tenon's capsule. *Ophthalmic Record*, October, 1913.

(3) **Genet.**—Ciliary staphyloma; ablation with preservation of the eyeball. (Staphylôme ciliaire, ablation avec conservation du globe oculaire.) *Revue Générale d'Ophtalmologie*, 30 novembre, 1913.

(1) **Wicherkiewicz**, of Cracow, implants an oval piece of skin, removed with the underlying adipose tissue from the arm of the patient. This graft is rolled up, the subcutaneous tissue being inside, and tightened with catgut. It is sunk thus prepared into Tenon's capsule after the enucleation, which is done as follows.—After having cut round the bulbar conjunctiva and freed it behind, the internal rectus muscle is raised by a sharp hook, and a needle with a thread of catgut passed through Tenon's capsule and the tendon of the muscle. Holding the two ends of the thread with the left hand, he releases the sharp hook, separates the muscle from the sclera, and finishes by cutting it through near its insertion. Then, giving the thread to an assistant, he proceeds in the same way with the external rectus, passing the needle, however, in the opposite direction—through the tendon first. The superior and inferior recti are similarly treated, then the oblique muscles, the optic nerve, and any other tissues holding the globe are cut through. Next, the cavity left is irrigated with cool sterile normal saline solution. After the skin implantation, he ties the threads of the internal and external recti, so as to draw together the tendon ends. Similarly, he treats the superior and inferior recti and completes the operation by a purse-string suture which closes the conjunctiva over the implanted skin. To save time, he suggests that an assistant cuts and prepares the graft while the surgeon enucleates the eye, and states that the remote as well as the immediate effects of this operation are good, contrasting favourably with the heteroplastic methods he has formerly used.

H. HAWARD BYWATER.

(2) **Spratt**, of Minneapolis, considers the implantation of fat the ideal method of making a mobile stump for an artificial eye, as it forms a sterile, autogenous graft, which when secured in Tenon's capsule, has less tendency to change its position than any of the foreign substances which are generally used. It offers little or no chance for extrusion, unless an infection takes place or a faulty method of suturing is used.

The author secures the recti on small hæmostats before they are divided, and after they are divided near their insertions, and the eye enucleated in the usual manner, the cavity is packed with a moist sponge, to stop the hæmorrhage. A piece of subcutaneous fat removed from the abdominal wall under aseptic precautions is inserted into Tenon's capsule. The tendons are secured over it by two mattress sutures of double 00 chromacized catgut; the second suture for the lateral recti being also passed through the previously sutured vertical muscles. A deeply-placed catgut purse-string suture brings Tenon's capsule over the fat and muscles, and another superficial purse-string suture brings the conjunctiva over all. J. JAMESON EVANS.

(3) **Genet**, of Lyons, has ventured to excise a ciliary staphyloma in a case where preservation of a sightless eye seemed worth while. The circumstances were peculiar in this respect, that although the staphyloma was the result of an accident, there had never been any ciliary reaction. Trusting to the asepticity of the operation performed, Genet considers that he runs no great risk. Probably few ophthalmologists will agree with him. The operation consisted in seizing the staphyloma with special forceps, introducing ligatures beneath the grip of the forceps, tying off the staphyloma from the interior of

the eye, and then excising everything behind the forceps and in front of the ligatures. The ligatures were passed in such a way that the cornea, on the one hand, and the coats of the eye behind the ciliary body, on the other hand, received the pull of the stitches. The eye remained perfectly quiet after the operation. There was no loss of vitreous. ERNEST THOMSON.

XIV.—REMEDIES.

(Tenth Notice.)

(1) **Wiener, Alfred.—A preliminary report upon the specific action of ethyl hydrocuprein on pneumococcus infection of the external tissues of the eye.** *Medical Record*, January 17th, 1914.

(2) **Possek, P.—Embarin in ocular affections.** *Berl. klin. Woch.*, 16 Februar, 1914. Ref. in *British Medical Journal*, May 2nd, 1914, No. 261.

(3) **Qurin.—Upon diathermy in eye work. (Ueber Diathermie am Auge.)** *Zeitschrift für Augenheilkunde*, Februar, 1914.

(4) **Pichler.—Eye baths. (Augenbäder.)** *Zeitschrift für Augenheilkunde*, Februar, 1914.

(5) **Crockett, R. L.—Diagnosis and treatment of iritis.** *New York State Journal of Medicine*, March, 1914.

(6) **Gifford, H.—On the treatment of sympathetic ophthalmia with atophan or novatophan.** *Ophthalmic Record*, July, 1914.

(7) **Stephenson, Sydney.—A case of sympathetic ophthalmitis treated by six injections of neo-salvarsan.** *Transactions Ophthalmological Society U.K.*, Vol. XXXIV, 1914, p. 142.

(8) **Sattler, Robert.—Radium therapy in a case of orbital metastasis consequent upon an intra-ocular sarcoma.** *Trans. Amer. Ophth. Society*, Vol. XIII, Part III, 1914, p. 778.

(1) **Wiener,** of New York, obtained the healing of an hypopyon-ulcer in the course of a very few days by means of a one per cent. solution of ethylhydrocuprein. The remedy was applied for half a minute in every hour, and this was done for six hours on the first day and for twelve hours on the next. Prior to the application, muco-pus was squeezed from the lacrymal sac, and the conjunctival sac was thoroughly cleansed with boric lotion. The condition responded to the treatment in eighteen hours.

SYDNEY STEPHENSON.

(2) **P. Possek** has tried this mercurial preparation in 49 cases of various diseases of the eye, chiefly, of course, syphilitic. Embarin is a solution of mercuri-salicy-sulphonate of sodium, containing 3 per cent. of mercury, with ½ per cent. acoin added as an anæsthetic. It can be administered by intramuscular injection in doses of 1.2 c.cm. The claim made on its behalf, that it fulfils the four essential requirements of an ideal mercurial preparation seems to the author to be justified. These four desiderata are (1) energetic

action, (2) absence of undesirable by-effects, (3) painless and easy administration, (4) not necessitating any interruption or modification of the daily routine of life or business. Possek found the injection of embarin painless, and provided that it was properly injected, with antiseptic precautions, into the gluteal muscle, and not into the connective tissue (and in stout persons with small gluteal muscles this requires some care), free from any local reaction, such as swelling or lump formation. Of the 49 cases in which the author tried embarin, 9 were non-syphilitic eye diseases; the remainder either certainly or probably syphilitic. Among the former was a case of sympathetic ophthalmia, and a case of traumatic iridocyclitis, in both of which syphilis could be excluded. In some of the syphilitic cases salvarsan was also employed, and in every case, of course, the appropriate local treatment also. The results, although under the conditions necessarily inconclusive, yet impressed Possek as very favourable, and he feels justified in recommending embarin as a convenient and reliable preparation of mercury, especially in ophthalmic practice.

(3) **Qurin,** of Wiesbaden, finds that the use of the high frequency current is a better way of applying heat to the eye than the thermophore or hot applications. A higher temperature can be tolerated, and the heat effect is produced more equally thoughout the whole organ. The treatment is useful in scleritis, keratitis, uveal inflammations, and in optic atrophy. It is to be avoided in glaucoma and arterio-sclerosis. The author has devised convenient electrodes, and points out that the use of diathermy demands expert physical knowledge of the apparatus and of the nature of the current.

T. HARRISON BUTLER.

(4) **Pichler,** of Klagenfurth, has used the eye bath for the last four and a half years, because he finds that many patients cannot use the eye dropper. He employs boric lotion, and solutions of zinc sulphate and calcium chlorate. The zinc sulphate lotion is useful in corneal ulcers. The eye bath is well known in England, and is probably used by most ophthalmic surgeons.

Pichler's paper contains nothing new, and no mention is made of the fact that zinc sulphate is especially useful in ulcers caused by the diplobacillus.

T. HARRISON BUTLER.

(5) **Crockett,** of Oneida, New York, speaks highly of the treatment of certain forms of iritis by the administration of vaccines. He narrates a case of sympathetic ophthalmitis which occurred some weeks after the contents of a panophthalmitic eye had been allowed to escape by removing the cornea. After three or four weeks of treatment by staphylococcic vaccine (prepared from the pus obtained from the exciting eye), together with atropine and dionine locally, the eye was free from inflammation and the sight was about 20/30.

SYDNEY STEPHENSON.

(6) **Gifford,** of Omaha, has formed a high opinion of the value of atophan in the treatment of iritis and of sympathetic ophthalmitis. He has so far treated about twenty cases of the former and four cases of the latter disease by these means. He recommends a grain *per diem* for each pound of the patient's body weight, and in exceptionally severe cases, a third more. Whilst taking the drug, the patients are confined to bed, at all events during the latter half of the day.

Gifford considers that atophan is fully as effective as the salicylates and their derivatives in all inflammations of the uveal tract. Its sole drawback is its cost, namely, \$1·50 an ounce, and novatophan 25 cents more.

SYDNEY STEPHENSON.

(7) The case reported by **Stephenson,** of London, is perhaps best resumed in the author's own words, as follows:

" A lad, *æt.* 9 years, sustained a penetrating wound of the left cornea, with entanglement of the iris and hyphæma, on August 22nd, 1913.

The family history was strongly suggestive of syphilis ; the lad's *facies* pointed in the same direction ; and on two occasions out of three, the Wassermann reaction was returned as " feebly positive."

Fifty-five days after the injury, it was found, almost by accident, as it were, for the signs of inflammation were trivial, that the sight of the uninjured eye had deteriorated, that posterior synechiæ were present, and that the intraocular tension was low. The wounded eye had by this time settled down into what seemed to be a quiescent state. That the synechiæ of the uninjured eye did not represent an antecedent inflammation was shown by the history of the case, as well as by the fact that barely three months before the accident, the eye was known to have sight of 6/12 and to be free from morbid changes.

Sixty-one days after the injury, the wounded eye was enucleated—that is to say, six days after the sympathetic disease had been first noticed.

In the five-and-a-half months between October 22nd, 1913, and April 7th, 1914, six intravenous injections of neo-salvarsan were made under the influence of general anæsthesia. The dose was from 0·4 grm. to 0·6 grm. After four injections had been given, and when the eye already showed signs of improvement, the inunction of half a drachm of mercurial ointment was made once in 24 hours. Meanwhile, symptoms have improved, while the sight has risen from 3/60 to 5/36 and No. 4 Jaeger. The eye is free from obvious inflammation, although it still flushes up on examination. The pupil is excluded ; a fine membrane is present in the pupil ; and the tension is a little *minus.* The disease, then, is not cured.

A differential blood-count was made after the last injection of neo-salvarsan, but whether the findings are to be considered as abnormal in a lad of this age, appears doubtful.

The exciting eye, when examined with the microscope, showed uveitis of the type associated with sympathetic ophthalmitis (Fuchs)."

(8) Some two years after an eye had been enucleated on account of a spindle-celled melanotic sarcoma of the choroid, the patient, a male, aged fifty-six years, presented recurrences in the orbit and the subcutaneous tissues of the abdomen, the thorax, and the lower extremities. Despite the hopeless outlook, **Sattler,** of Cincinnati, determined to try treatment by radium. Before making the application, a dark, marble-like mass, about the size of a hazel nut, attached by a constricted base to a deeper mass which filled the apex of the orbit, was ablated. The radiferous tube was then embedded in a tunnel made in the remaining part of the sarcomatous mass, and kept in place for twenty-four hours. Inflammatory reaction, shown by infiltration of the entire mass, etc., followed. After an interval of six days, two tubes, which contained 100 mgs. of radium, were placed in a similar position for twenty-four hours. This was followed by a sharper inflammatory reaction. Sattler's experiment (for that is what it amounted to) has once again demonstrated the powerful penetrative powers of radium rays. The influence upon the orbital growth was favourable. At the same time, the other deposits increased, and when the case was reported, it did not seem that a lethal end could be postponed much longer.

Discussion.

S. Theobald, of Baltimore, spoke of a result likely to be good in a case where a hard mass showed itself in the orbit some weeks after the eye had been removed on account of neuro-epithelioma of the retina. It is to be noted, however, first, that the case is not complete ; and, secondly, that the gliomatous nature of the orbital mass is not confirmed.

C. F. Clark, of Columbus, narrated the case of a child, two years of age, believed to be affected with a sarcoma of the orbit. A tube of radium was inserted into the neoplasm exposed by canthotomy and free division of the external rectus muscle. The tube was again inserted at the end of a fortnight. On each occasion it was left in position for four hours. Proptosis receded, and now after the lapse of nearly two years, the case is still doing well. It is to be noted that some six months after the radium had been applied, the corresponding eye was found to have developed a well-marked nuclear cataract.

Andrew Timberman, of Columbus, spoke of a case where melano-sarcoma of the ciliary region was followed after three years by a cancer of the abdominal region.

H. Friedenwald, of Baltimore, related the cure of a large epithelioma of the upper lid as the result of several massive applications of radium. Later, the eye had to be removed on account of glaucoma.

E. C. Ellett, of Memphis, had seen an epithelioma over the region of the lacrymal sac cured by radium. X-rays had been tried without effect.

W. Zentmayer, of Philadelphia, had seen an epithelioma of the lower lid aggravated by the use of radium. It spread from the lower to the upper lid, and involved the eyeball, necessitating evisceration of the orbit.

SYDNEY STEPHENSON.

BOOK NOTICES.

Eye, Nose, Throat and Ear : A Manual for Students and Practitioners. By JAMES FORREST. London : Henry Kimpton, 263, High Holborn, W.C., and 40 & 42, University Avenue, Glasgow. 1914. Price 10s. 6d. net.

Of Dr. James Forrest's book of some four hundred pages, rather more than one-half is devoted to the eye, and the rest to the nose, throat, and ear. As regards the part that more particularly interests us, considerable space for so small a book is given up to errors of refraction and their associated conditions. One may note in passing, according to our author, that in order "to obtain a correct retinoscopic result it is rarely necessary, except in children, to instil a midriatic, but the dilated pupil induced is a most useful adjunct to the inexperienced." Dr. Forrest puts non-essential theoretical considerations on one side ; touches lightly upon pathological points ; describes the more important diseases succinctly ; and gives but a brief notice of those operations scarcely likely to be performed by the general practitioner of medicine. By these various means he has succeeded in producing a concise work of some considerable practical value. 122 illustrations and 12 coloured plates serve to illumine the text.

It is unfortunate that the text is marred by many printers' blunders, an attempt to remedy which will doubtless be made when a second edition of this handy little book is called for.

Contributo clinico ed anatomico allo studio dei teratomi della superficie corneo congiuntivale e rapporti colla blefaroschizi. By GIULIO PIGNATARI. Torino: Rosenberg e Seelier. Pp. 126, with six plates.

In this monograph, Pignatari gives a full account of all that has been written hitherto on the subject of the teratomata of the corneo-conjunctival surface, including the pure dermoids, the lipodermoids, and the mixed forms. He gives a full account of the facial and branchial clefts, and discusses the possible relations between these clefts and the teratomata. As a result of his investigations, he came to the conclusion that a coloboma of the lid is due to an imperfect closure of one of the facial clefts; or, rather, to an imperfect development due to the imperfect closure of one of the oblique facial clefts. He concludes that amniotic bands attached to the eye are so rare that it is not conceivable that all dermoids should be due to them; nor does the situation fit, since such bands would probably be attached to the most prominent part of the eye, and not to the sulcus between the cornea and the sclerotic.

The true nature of the dermoid is that it is a part of the free margin of the eyelid which has become adherent to the globe, and gradually separates from the remainder of the eyelid.

A full bibliography is given. H. GRIMSDALE.

The Present Position of the Treatment of Tuberculous Affections of the Eye. (Ueber den heutigen Stand der Behandlung tuberculöser Augenerkrankungen.) By Prof. Dr. E. HERTEL, Strassburg. Vossius' *Sammlung zwangloses Abhandlungen*, Bd. IX, Heft 7. Halle a. S.: Carl Marhold, Verlagsbuchhandlung. 1914. Price, M. 1.60.

Professor Hertel's *brochure* forms a valuable review of the present-day therapeutics of ocular tuberculosis, based largely on the literature of the last thirty years, but embracing also the results of his personal experience. He finds a general consensus of opinion to the effect that tubercle of the eye is seldom primary. Even when it seems so, the tubercle bacillus may be in the blood or in some hidden situation, and enucleation therefore does not rid the body of infection. Another widely acknowledged fact is that tuberculosis, either in the mild or in the severer forms, may spontaneously heal. For this reason it is always wise, in the first place, to treat on conservative lines: but two conditions in which he thinks enucleation is indicated are intra-ocular tubercle, with extension through the coats of the eyeball, and tubercle of the nerve head. Surgical treatment is, of course, appropriate for tuberculosis of the lacrymal sac and gland, of the conjunctiva, and of the orbit.

Among the "conservative" measures which may be employed there is a large number of local applications which, according to the author, resemble each other and produce their effects by inducing local hyperæmia. In addition to these, we have general treatment, such as the combined employment of diaphoresis and mercurial inunction, arsenic and other drugs, and climatological treatment.

From this point the author proceeds to deal with the history of tuberculin therapy from the days of Koch's experiments to the present, and he makes an attempt to estimate the value of this line of treatment from a consideration of the literature. In this connection he points out the difficulties in the way of determining whether tuberculin therapy has been an advance on the treatment of pre-tuberculin days. To take only one point, there are many cases now known to be tuberculous which would not have been so considered in those days, and these belong chiefly to the group of milder cases which show a high percentage of recoveries under other forms of treatment.

Putting aside phlyctenular cases, cases of lupus, and affections of the tear sac, his own material amounts to 57 cases. While a large proportion of these did well under treatment, he finds it difficult to say how far the good results were attributable to the treatment. In his opinion, not more than 20 per cent. of them could be said to have benefited from tuberculin therapy. The issue is a good deal confused by the tendency to spontaneous healing.

Reviewing the efforts made to demonstrate the curative effects of tuberculin on inoculated tubercle, Hertel expresses the opinion that it has not been possible to produce certain cure of inoculated tubercle by means of tuberculin.

A good deal of literature has been devoted to the question of the choice of a tuberculin preparation. The author's conclusion, from a consideration of the literature and of his own material, is that it is a mistake to aim at a slow and quiet cure. He thinks a better result can be obtained by doses calculated to produce a moderate focal reaction, and that for this purpose the best preparation is the old tuberculin, especially in its albumose-free form. An important point, in his opinion, is the continuance of the treatment for a sufficiently long time, so long indeed as symptoms remain or the focal reaction can be elicited. This course of treatment having been completed, no further course should be entered upon unless and until a recurrence shows itself clinically.

In the present state of our knowledge regarding the action of tuberculin, it cannot be said to have supplanted the earlier and less specific methods of treatment. Consequently, we are not only justified in applying all these methods, but are obliged to do so until some more perfect means of combating the disease can be found.

A. J. BALLANTYNE.

NOTES AND ECHOES.

Deaths.

WE regret to announce the death of Martin H. Post, of St. Louis, Mo., which took place suddenly on September 1st last at the age of 63 years. His was indeed a useful life. He took the greatest interest in all that appertained to blindness, its prevention and its alleviation. For a long term of years he was a member of the Board of Management of the Missouri School for the Blind, to which he was also attached in a medical capacity. After acting as assistant to Dr. John Green, Post went abroad, where he studied under Donders, Snellen, and Nettleship. He was elected president of the American Ophthalmological Society only the other day at the meeting of that body held at Hot Springs, Va. At the time of election he was vice-president of the Society. Personally, Post was a thoroughly earnest and very lovable man.

Another distinguished American ophthalmic surgeon in the person of Hasket Derby, of Boston, Mass., has joined the great majority. Derby was a pioneer in ophthalmology. He was one of the founders of the American Ophthalmological Society, Henry D. Noyes, of New York, being the other, and had contributed a good deal to the literature of his speciality. His last years were spent in retirement at Mattapan, Dorchester. Death took place at the ripe old age of 79 years.

* * *

Midland Ophthalmological Society.

Members of this Society who practise in the Midland area have unanimously agreed to charge a fee of two guineas for first reports under the Compensation Act.

* * * *

New York Board of Health.

ONE notes with pleasure that by a recent order of the New York Board of Health gonorrhœal ophthalmia and trachoma are among the diseases notifiable within twenty-four hours of the time when they are first seen.

* * * *

Oxford Ophthalmological Congress.

THE next meeting of the Congress will be held at Keble College, Oxford, on July 15th and 16th, 1915. The subjects for discussion will be industrial diseases of and accidents to the eye.

Mr. Sydney Stephenson has been appointed Master, vice Mr. R. W. Doyne nominated as Past-Master. Mr. P. H. Adams has become Deputy-Master, and Mr. Bernard Cridland, Secretary. Sir Anderson Critchett, C.V.O., retains the Treasureship. Colonel R. H. Elliot has been elected a Member of the Council.

* * * *

The Antarctic Expedition.

THE officers of the Antarctic Expedition, which is led by Sir Ernest Shackleton, have devoted special attention to the question of protection against snow blindness, which, as is well known, has caused a great deal of suffering and inconvenience in previous expeditions to the Antarctic.

Every member of the expedition has been supplied with a special pair of goggles, which it is anticipated will provide all possible protection.

The form of these goggles in ordinary cases is a pair of gauze eye cups, made of aluminium nickel alloy, joined together by an adjustable leather bridge. The edges of the cups which touch the skin are leather bound, and the goggle is fixed by an adjustable leather strap passing round the head

Each goggle has been glazed with lenses ground in Euphos glass made to the formula of Professor Schantz, in the tint commercially known as number 4. This glass has been proved experimentally at the National Physical Laboratory and elsewhere, to absorb *the whole* of the ultra-violet rays. Up to the present the only instance recorded in which this glass has been used in Polar exploration was on Amundsen's Expedition, when he and his assistant, Hansen, both wore Professor Schantz's glass, and were the only two members of the expedition doing so. They record that they were the only two members of the expedition that did not suffer from snow blindness in any degree.

In the case of one of the surgeons of the expedition, who is astigmatic to the extent of 3½ diopters, the only difference made has been to fix a leather bound rigid bridge instead of the adjustable one, so that the whole goggle front itself will be perfectly rigid; all minor adjustments for axis can be easily made in fixing the leather strap round the head.

In the case of one of the geologists, who is myopic to the extent of 4 diopters, a film of Euphos glass has been fused on to a white blank, on which blank the whole of the correction has been ground, so that equal tint protection is provided from centre to edge, irrespective of the varying thicknesses of the glass.

Each man has been provided with a spare pair of lenses, and the frame so made that on levering up a little of the leather binding on the edge of the cup, a pin can be easily removed which opens the rims, and after replacing the broken lens, the rims can be just as easily fastened together again by re-insertion of the pin.

The expedition has also been supplied with tubes of a special preparation, with which the lenses can be cleaned and polished, and which will prevent the condensation of the wearer's breath on the glass.

Sir Ernest Shackleton has already reported after using specimen goggles made for experiment on his Norway Test Expedition, that they proved to be satisfactory in every particular, and it is anticipated that, as a result of wearing these glasses, there will be very little trouble caused by the effects of snow glare on the eyes of the members of the expedition.

The goggles have been supplied by Messrs. Rowley & Co., Ltd., King Street, Manchester.

* * * *

The Scottish Ophthalmological Club. It has been decided that the usual autumn meeting of the Club be not held this year.

* * * *

Local Anæsthesia. In the course of a review of a book on local anæsthesia the *Universal Medical Record* tells a good story of a well-known pioneer in the world of ophthalmic surgery, who on the introduction of cocaine extended the use thereof to the excision of the eye. After one of these operations, he was descanting enthusiastically to the onlooking students on the painlessness of the operation, when the unfortunate man turned to him and exclaimed "You b——!"

THE OPHTHALMOSCOPE DIARY.

	1914.	
Royal Society of Medicine: Section of Ophthalmology	November 4th	1, Wimpole Street, London, W.
	1915.	
Royal Society of Medicine: Section of Ophthalmology	February 3rd	1, Wimpole Street, London, W.
Royal Society of Medicine: Section of Ophthalmology	June 9th	1, Wimpole Street, London, W.
American Ophthalmological Society	July 6th & 7th	New London, Conn.
British Medical Association: Section of Ophthalmology	July 7th to 9th	Cambridge.
Oxford Ophthalmological Congress	July 15th & 16th	Keble College, Oxford.
Midland Ophthalmological Society	December 1st	Birmingham.

THE
OPHTHALMOSCOPE.

A MONTHLY REVIEW OF CURRENT OPHTHALMOLOGY.

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ORIGINAL COMMUNICATIONS.

THE TEACHING OF CLINICAL OPHTHALMOLOGY.

BY

C. O. HAWTHORNE, M.D.Glasg.

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THE question of the teaching of ophthalmology to students of medicine, when discussed in a medical society or journal, may be taken to mean instruction in such knowledge of the visual apparatus, and of the function of vision, as is likely to be of service in the diagnosis, prognosis, and treatment of disease. No doubt this clinical teaching, to be effective, implies a sufficient training in the embryology, anatomy, physiology, and pathology of the several anatomical structures concerned. This training, however, fails to be provided in the appropriate sections of the medical curriculum, and its organisation hardly comes within the present purpose. It is the application of these preliminary studies to medical and surgical practice which constitutes ophthalmology in the ordinary sense of this term, and hence the subject to be considered in the present paper may be more precisely stated as the teaching of ophthalmology in its clinical or practical aspects. That this involves instruction in the actual conditions of disease existing in individual patients is, of course, obvious; and the immediate question is, by what machinery should this instruction be supplied. In reply, and as a statement of general principle, my proposal would be that clinical ophthalmology, like other branches of the medical art, should be taught in those divisions of the medical curriculum where its application has the greatest opportunity of practical service. The art of percussion is taught in clinical medicine because there is its occasion and value. The methods of amputation are taught in clinical surgery because there is their field of application. The teaching of ophthalmology ought to be determined by a similar principle; and were this principle adopted, its translation into an active policy would proceed upon obvious and readily defined lines.

Thus, in the first place, there are certain clinical disturbances and defects in the eyeball which are mainly or solely of importance as local conditions producing a greater or lesser degree of visual disturbance—the presence of a foreign body, an opacity of the lens, a corneal ulcer, and an error of refraction, may be mentioned as examples. Further, these and such-like local conditions can very largely be removed, or favourably modified, by operative or other mechanical methods; and their recognition and rectification constitutes the department of ophthalmology known as ophthalmic surgery. Therefore, in accordance with the principle above enunciated, it is in the department of ophthalmic surgery that the student should be taught how to recognise, and how to treat, those clinical states of the eyeball which are susceptible of relief by operative, mechanical, or other topical methods.

As contrasted with diseased conditions of local importance, there are other disturbances of the visual apparatus which are not capable of mechanical treatment, and which are significant mainly because they are evidences of the existence of visceral or constitutional disease. Paralysis of the ocular musculature, retinal hæmorrhages or exudations or embolism, optic neuritis or atrophy, and disturbances in the visual fields, may each, no doubt, produce serious ocular and visual symptoms, but each of them is of high clinical importance chiefly because its existence establishes a demand for a complete investigation of all parts of the body as a necessity both for accurate diagnosis and appropriate treatment. In other words, every one of these disturbances claims the application of the methods which are systematically in operation in the teaching of clinical medicine. A knowledge of these conditions, therefore, finds its practical application not in surgery but in medicine, and hence, on the principle already defined, it is in the medical wards and out-patient department that medical ophthalmology, as distinct from surgical ophthalmology, should be practised and taught.

The adoption of the plan thus proposed would have various and considerable advantages. First, it would present those clinical disturbances of the visual apparatus which are an expression of constitutional disease, in their natural setting and amidst their natural relationships. Retinitis, to take a simple example, is as much a part of kidney disease as is pericarditis, and its clinical study ought to be conducted in accordance with this doctrine. A homonymous hemianopia carries the same clinical message as does a hemiplegia, and both require identical methods of investigation and diagnosis. Thus, to quote only these two illustrations, retinitis and hemianopia have their natural field of study in association with the diseases which cause them, that is in the department of clinical medicine, and anything which divorces them from this position is artificial, and is therefore disadvantageous to liberal studies and to correct perspective.

A second advantage of the teaching arrangements here proposed is that their adoption would leave the student free, during his necessarily brief stay in the department of ophthalmic surgery, to devote his attention entirely to such appropriate subjects as errors of refraction, external diseases of the eye, and operative procedures. He would escape the attempt, hopeless in the short opportunities at his disposal, to do justice to these, and at the same time fully to study changes which are incidents in the evolution of general diseases, and not mere displays for ophthalmoscopic contemplation.

Thirdly, the systematic recognition in the teaching of clinical medicine of the possible contribution from ophthalmological investigation, would keep constantly before the mind of the student the conclusion that the absence of all complaint of defective sight is no guarantee of the possession of a healthy fundus oculi. Hence he would learn, both from precept and from example, the necessity of an ophthalmoscopic examination in every patient. Further, as the student necessarily spends a relatively long time in the study of clinical medicine, the rule just mentioned would mean that he would have the opportunity of examining many normal eyes (a most important part of his education), and that he would become apt and confident both in methods of examination and in his ophthalmoscopic observations and judgments. Here, as elsewhere, the only adequate preparation for the detection of the abnormal is a thorough and sustained education in the extent and limits of the normal.

To put these advantages in a word, teaching conducted along the lines here suggested would both secure for the student an undivided attention to surgical methods in the surgical clinic, and would, in clinical medicine, that is in the appropriate atmosphere, train him to appreciate the relation between certain ocular and visual disturbances and the general diseases of which these disturbances form a part.

It may be well to consider two objections which may possibly be urged against these proposals. First, it may be said that in clinical medicine the student cannot be instructed in optics, or in what are somewhat grandiloquently termed "the principles of the ophthalmoscope." The reply to this objection is, that in so far as such instruction is necessary, it is already provided in the classes of physics and physiology; and, further, and on the strictly practical plane, it is to be noted that the examination of the fundus oculi and other parts of the eyeball, particularly in these days of the self-lit electric ophthalmoscope, is a matter of great simplicity, and needs practical training and opportunity rather than theoretical instruction.

In the second place, it may be objected that among medical patients ocular changes as the result of general diseases are not frequent, and that, therefore, on the plan proposed, the student's education would be scanty and incomplete. To this it may be answered that such conditions would be discovered more frequently were they looked for as a matter of routine. And again, in so far as this objection is well founded, it must mean that cases of nervous disease, of cardio-vascular disease, and of kidney disease, are detained in the ophthalmic surgical clinic, when, manifestly, all such cases require the methods of investigation and treatment practised in the department of clinical medicine. Neither one objection nor the other has much valid foundation, and neither opposes any substantial difficulty to the arrangement of ophthalmological teaching on the plan here indicated.

To present now in summary the scheme which I wish to suggest, instruction in ophthalmology for medical students should be conducted in three departments—

1. Instruction in the optical relations of the eyeball and of the ophthalmoscope in the classes of physics and physiology; in the latter, also, the student's attention would be directed to the relations which exist between the several parts of the visual field and the corresponding parts of the visual pathway.
2. Instruction in the systematic use of the ophthalmoscope, of the perimeter, and of the methods of testing the musculature of the eyeball, in the medical wards and out-patient department, where there should be a complete collection of ophthalmoscopic pictures illustrating the various diseased conditions of the fundus oculi.
3. Instruction in the estimation and correction of refractive errors, in operative methods, and in the diagnosis and treatment of external diseases of the eyeball and its related parts, in the department of ophthalmic surgery.

Probably, as in other branches of practice, there would be a certain amount of overlapping in these several divisions, but this need not in any appreciable degree confuse the main lines of the proposal. This proposal, if adopted, would secure a combination by which, and as I venture to think by which alone, the practitioner can be equipped to take from ophthalmology the full service it is capable of rendering in the wide field of medical and surgical practice.

ON THE TREATMENT OF ENTROPION BY GRAFTING LIP-MEMBRANE INTO THE INNER SURFACE OF THE TARSUS.

BY

H. GIFFORD, M.D.,

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Apropos Dr. W. O. Maher's article in the April number of THE OPHTHALMOSCOPE, in which he again recommends the operation first described by him in 1897, it may be worth noting that I described essentially the same operation in the *American Journal of Ophthalmology*, January, 1892.*

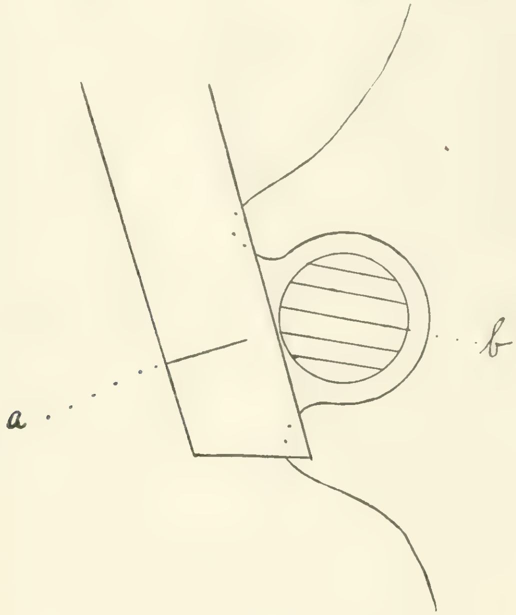

FIG. 1.
a.=cut in under surface of tarsal plate.
b.=cross-section of cotton cylinder.

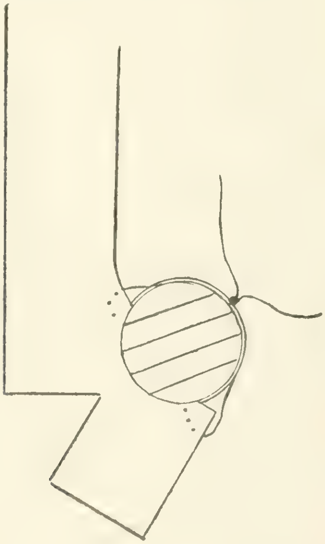

FIG. 2

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* Even before this, Noisewski had advocated the grafting of lip membrane into the under side of the lid, but this was for the cure of inveterate trachoma, not for entropion. The trachomatous parts of the tarsus are scraped or cut away and membrane put in its place. I have tried it in a few cases, and can testify to its effectiveness, when extirpation of the tarsus is not desirable.

It is not surprising that my suggestion was overlooked by Dr. Maher, as it was concealed by the title, which referred only to the use of Thiersch flaps. The *technique* which I there described, and which I still follow, consists in making an incision through the tarsus from the inner surface, about 3mm. from the free margin. This cut is made to gape by inserting three sutures as follows : the needle is passed through the outer edge of the free margin of the lid, taking a bite rather more than 1/16th inch wide, then it is passed through a small fold of the lid-skin about 3/16ths inch farther away from the lid-edge. Before the threads are tied, a bit of wet cotton is rolled into a hard cylinder about 3 cm. long and 5 mm. in diameter (Fig. 1). This is slipped between the loose loops of thread and the outer surface of the lid, so that when the threads are tied they press the cylinder against the lid and evert its margin. A cross section through such a cylinder and lid near one of the untied sutures, would look something like Fig. 1 ; while after tying the thread tightly, the appearance would be more like Fig. 2. Into the tarsal cut thus made to gape, one can introduce either a Thiersch flap or a strip of lip-membrane, and if a little hæmorrhage is started by scratching the sides of the cut here and there (to get fresh fibrinogen), and the graft is carefully pressed into the gap with a moist instrument, it heals, almost invariably, without any retaining sutures.

At the time my first paper was written, I was using both lip and skin and was uncertain which was preferable, but after a year or so I gave up the Thiersch flap, and have since used lip almost exclusively, because although the skin graft cured the entropion, it remained skin, and the accumulated epidermis on its surface produced a very slight discomfort, unless, it were wiped off once or twice a week. For the last fifteen years, I have, in operating for trichiasis, generally done a modification of the van Millingen operation, putting a lip graft into the split lid-margin ; but in cases with the margin turned in extra far, I have put the lip into the tarsal surface, as above described, and have added Hotz stitches later if necessary. My reason for limiting the procedure to exceptional cases is that it has seemed to me easier to put the lip into the lid-margin. However, for the beginner especially, putting the lip into the tarsal surface has the great advantage that there is no danger of leaving any lashes on the wrong side of the cut The cosmetic effect is also somewhat better, especially if the lip is put into the lower lid. Whether or not Dr. Maher's *technique* is preferable to mine I am not prepared to say, but if in either form the operation comes to be more generally adopted, the greater constancy which he has shown to the idea certainly entitles him to the larger share of whatever credit it may deserve.

OCULAR ANGIO-SCLEROSIS.*

BY

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The term Angio-sclerosis.

OCULAR angio-sclerosis, as a term to indicate the hardening or over-growth of connective tissue of the walls of the blood-vessels of the eye, is perhaps a better term under which to group the type of changes to be here discussed, than to refer to the process either as arterio- or phlebo-sclerosis, although it must be confessed that the term arterio-sclerosis, through common usage, conjures up the most definite conception to the minds of many of us.

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* Read before the Eye, Ear, Nose, and Throat Section of the Medical Society of the State of California, Santa Barbara, Cal., April 15th, 1914.

The study of sclerosis of the vascular system is especially interesting to ophthalmologists, because in the eye, as nowhere else in the body, do we find an organ with terminal arteries where many of the changes in the structure of the blood-vessels can be thoroughly examined from day to day.

Vascular sclerosis closely associated with faults of our civilization.

The close association of sclerosis of the vascular system with some of the major faults and vices of our civilization, such as over-eating, high tension living (both mental and physical), alcoholism, and syphilis; and its intimate connection with chronic nephritis (perhaps as often a precursor as a corollary of the last-named disease); as well as with the fault of simple old age (a condition most of us aspire to in spite of its defects and disadvantages), even though we are less disposed to accept that of our heredity, a causative factor also to be reckoned with; and the further fact that vascular sclerosis more often manifests itself after the age of forty, at which time most persons have occasion to seek the services of an oculist; and that a careful examination of the fundus at that period may give important data at just the time when there may be few other clinical symptoms of arterio-sclerosis elsewhere, should make this subject one of equal and of very considerable interest to eye specialists and to general practitioners alike.

Angio-sclerosis a grave disease.

General arterio-sclerosis is a condition not to be permitted to go on to terminal or very frank stages, if health and life are to be conserved; and ocular angio-sclerosis, not alone because of its capacity to impair vision, but because the changes of the sclerotic process are in the eye sometimes earlier or more evident than in other portions of the body, and can therefore, be the means of earlier diagnosis and proper treatment; and through its early recognition we may be in a position to prolong the life of a considerable number of our patients.

Ocular angio-sclerosis frequent past the age of forty.

Hirschberg, in a series of cases of old persons coming to him for refraction, found evidence of retinal angio-sclerosis in fifty per cent., and microscopic examinations of the retinal vessels of old people show, according to Hertel, an even higher percentage of sclerotic involvement than this.

Hypertension a frequent concomitant of angio-sclerosis; and the need of determining whether hypertension exists.

Since the sclerotic changes are so often associated with hypertension of the vascular system, the question suggests itself as to whether it should not be a routine practice for eye specialists to take the blood pressure of all patients seeking refraction about the age of forty and after; to the end that a special effort may be made to obtain an exact record of the condition of ocular vascular system in such persons as give evidence of increased blood pressure. The fact that an increased general blood pressure so discovered may also enable us the better to guard against glaucoma, is likewise important to eye specialists.

Increased vascular blood pressure has also been noted in connection with cataract, and even though it is not possible to stop this lens change, appropriate treatment may, before cataract extraction, somewhat reduce the danger of post-operative hæmorrhage.

The fact that it is still a matter of discussion as to whether vascular hypertension is or is not antecedent to vascular sclerotic changes, need not concern us, since we are in possession of the important fact that nearly always this hypertension is one of the early manifestations or concomitants of vascular sclerosis; although it must be remembered that there be those who believe that in this early stage, a hypotension may alternate with a hypertension (the latter construed to be dependent at this stage upon a spasm of the muscular coats of the arteries).

Intra-ocular globe tension might also well be taken.

In taking these blood pressure readings, it might well be a part of our routine to take also a reading of the intra-ocular globe tension with a Schiötz tonometer or a Gradle or other modification. The tonometer, (using 1 per cent. holocain, which is slightly antiseptic, and which does not exfoliate the corneal epithelium, as does cocaine, to anæsthetize the cornea) can be quickly used; and the information received from such a tonometer reading, is generally conceded to be far more accurate and valuable than that from finger palpation.

The normal anatomy of the retinal blood-vessels.

According to Oatman, in the large central artery of the optic nerve, there can be demonstrated an outer (adventitia) of connective tissue; a middle (or media) of elastic and fibrous tissue, interspersed with a few muscle elements; and an inner (or intima) made up of (1) an elastic lamina; (2) a subendothelial layer; and (3) a stratum of endothelial cells. As the central artery appears on the disc, however, and its branches get farther away therefrom, the above-mentioned subendothelial layer and elastic layer of the intima usually give place to a few elastic fibres only.

As regards the normal veins, however, in the retinal divisions of the normal central vein, this subendothelial layer, and the so-called elastic membrane of the intima, are lacking; and the retinal veins are, in fact, little more than tubes of fibrous tissue lined by endothelial cells.

The morbid anatomy of the retinal blood-vessels.

It is not necessary for our purpose to go into much discussion concerning the microscopic morbid anatomy of the sclerosed blood-vessels other than to reiterate that in the arteries, the inner coat shows a thickening, either from patchlike areas of endothelial proliferation, or from a very considerable addition to the subendothelial connective tissue (the latter more of a fibrosis, and the process most often met with in the veins); the middle coat presenting usually areas of necrosis and hyaline and fatty degeneration, with formation of atheromatous *detritus*, which may or may not be later on infiltrated with calcareous material. The outer coat in more advanced cases may also show thickening, but whether this is due to the circulating toxins or is only an evidence of compensatory thickening or protection of the vessel wall, is not yet determined.

In phlebo-sclerosis, the intima likewise shows the increase of connective tissue in the internal coat, and the degenerative changes in the outer layers, with a weakening and widening thereof, or if calcareous deposits be associated, then a stiffening or hardening of the vessel.

These facts concerning the normal and abnormal anatomy of the retinal blood-vessels should be borne in mind in any consideration of the changes which take place in ocular angio-sclerosis.

How the internal eye tunics suffer through angio-sclerosis.

As a result of the angio-sclerotic changes, the eye tunics are supplied by blood-vessels with narrowed lumina and bathed with blood containing the toxic elements lying at the root of the sclerosis. Consequently, the nutrition and metabolism of the retinal and other ocular tissues suffers. Associated with the above factors are the weakened vessel walls and their greater tendency to leak and be responsible for hæmorrhagic spots in the retina.

The effects of angio-sclerosis on vision.

Sudden diminution of vision of marked amount does not, however, usually result from angio-sclerosis, except when the sclerotic changes occlude the lumen of the central artery or vein ; or, with more extensive weakening of the ocular vessels, are responsible for a sudden intra-ocular hæmorrhage.

A weakness in the visual power in persons past forty, which does not respond to suitable refractive correction, should, however, lead to a suspicion of vascular changes, and indicate a close examination of the retinal vessels to see if such changes can be discovered.

Systemic signs of angio-sclerosis also worthy of note.

In these patients in whom arterio-sclerosis is suspected, it is well also to have the blood pressure taken, and the heart examined to determine whether a hypertrophied left ventricle is associated with accentuation of the aortic second sound, or increased intensity of the first sound, or whether there is any displacement of the apex beat. A careful and periodical examination of the urine should also be made.

If the picture of retinal angio-sclerosis be at all advanced, even though the general signs of arterio-sclerosis be not prominent, the possibility of concurrent cerebral arterio-sclerosis, with its danger of apoplexy, should be kept in mind.

Clinical stages of systemic angio-sclerosis.

Just as in tuberculosis we deal with three stages of incipient, intermediate, and terminal involvement, so also in vascular sclerosis do we find a beginning stage, difficult of recognition ; an intermediate stage, with franker signs ; and a terminal stage, in which the involvement is so general as to nullify much of our attempted therapy. It is in this third or last stage also that patients are seen in whom a steadfast hypo- may succeed a previously persistent hypertension.

Peculiarities of the eye structure in relation to ocular angio-sclerosis.

Without further comment, we can now pass on to a consideration of ocular angio-sclerosis proper, simply again calling attention to the fact that in the eye, we are dealing with terminal or end arteries of very delicate structure, with little or no arrangement for compensatory circulation (although with the retinal veins there is more provision for a collateral circulation), so that endovascular irritants have full opportunity to make their power felt ; and, further, that because of the structure of the eye, we can use our dark room instruments in making close and systematic observation of these changes, the handicap being not always that the changes are not present, but that in our haste we fail to note them.

Subjective manifestations of ocular angio-sclerosis.

Among subjective phenomena may be noted early decrease in the power of accommodation, or severe headache persisting after refraction has been corrected at the onset of presbyopia. The subject of diminution of vision has already been discussed.

Objective signs of ocular arterio-sclerosis.

Among the objective manifestations are the following :

General : Arcus senilis ;
Slow reaction of the pupil ;
Hyperæmic optic disc of dull-red color ;
Œdema of the retina (patches more often in the vicinity of the disc or blood-vessels).

Course of arteries : a tendency to cork-screw course in one or more arteries, especially the smaller arteries and veins near the disc.

Number of arteries : a seeming increase in the number of smaller retinal vessels, due to dilatation making them visible to the eye.

Pressure effects of arteries : a disposition on the part of the harder arteries to flatten out the veins somewhat, at the places where the arteries cross the veins ; or it may be that the course of the vein at such a crossing, where it can ordinarily be traced beneath the artery without loss of continuity, is lost until it reappears on the other side of the artery.

Light streaks on arteries : an increase in the brightness of the light streak (the so-called " silver wire " appearance). Other streaks on arteries : with perhaps an associated continuous, or interrupted and somewhat nodular whitish streak of lesser brightness outside the vessel walls (this appearance being in the retinal peripheral vessels in contrast to the occasionally seen congenital connective tissue sheath of vessels which is limited largely to the disc area), these perivascular streaks being due to an infiltration in the lymph sheaths of the vessels, or to the fact that the usually transparent vessel walls in their now thickened state reflect more light from the blood stream than formerly.

Colour and translucency of arteries : a decrease in the colour and translucency of the vessel walls.

Locomotion pulse : with these changes may be present the so-called " locomotion," or arterial pulse, not dependent upon pressure, as in glaucoma. Such a pulse is often best seen where the arteries bend sharply.

Venous pulsation : in advanced retinal arterio-sclerosis, because of the hardened blood-vessels, digital pressure on the eyeball may fail to bring out venous pulsation or blanching of the vessels.

Calibre of arteries : while the arteries are not often widened in the earlier stages of retinal arterio-sclerosis, later on they may become narrowed. The larger arteries, or veins, of the optic disc at times show some of these changes best.

Disc margin appearance : in addition to the above, the optic disc and the larger retinal vessels may be surrounded by a greyish haze.

Hæmorrhagic spots: where the disease has made greater progress, blood extravasation may occur near the vessels, ranging from dots and short streaks to real blotches of hæmorrhage.

Ocular angio-sclerosis a disease affecting both arteries and veins; and further signs in relation to some of the phlebo-sclerotic changes.

The changes noted above may not only involve veins as well as arteries, but also, to a certain extent, may be almost limited to the veins. This seemingly larger involvement of the veins in ocular than in general vascular sclerosis, may be explained in part perhaps, because in the eye we can watch minute changes in the vein, size, course, etc., which because of less firm anatomical structure than the arteries, are less discernable through coarse finger palpation, etc., in other portions of the body.

In the veins, also, there may be the picture of constriction and dilatation in different portions of the same vein.

If a hardened artery press firmly on a vein beneath, there may be dilatation in the portion of the vein in the periphery of the fundus; while the part next to the disc is narrowed. The pressure of the artery helps the tendency toward the phlebitis, which is already present as a result of the basic causes of the angio-sclerosis.

If the vein walls weaken only in spots, then in lesser degree, the veins may show the bulbous varicosities seen in other parts of the body.

With more advanced phlebitis, and the secondary constriction of the vein lumen, spots of adjacent hæmorrhage appear often also.

Both intra- and extra-ocular hæmorrhages of significance as regards angio-sclerosis.

In connection with retinal hæmorrhage, it is well to remember that in intra-ocular blood extravasation that cannot be otherwise accounted for, occurring in persons about the age of forty or after, such a sign should always suggest thorough examination of the blood pressure of the individual. To a certain extent, this same suggestion applies to so-called idiopathic subconjunctival hæmorrhage and œdema of the lids.

An early recognition of ocular angio-sclerosis is very important.

These, then, are some of the signs of angio-sclerosis as seen in the eye, and as stated in the beginning, the gravity of the general disease process, and the necessity of an early recognition and treatment thereof, warrant a close examination for such changes in the fundi of all persons coming to us for refraction about or after the age of forty. By so doing, in a considerable number of instances, it will be possible to conserve the health and prolong the life of patients who themselves are altogether unconscious of the serious malady at work within their bodies.

A few words on treatment.

In closing, a few words in regard to treatment may not be amiss. The early detection of vascular sclerosis is, of course, of great importance, because then the cause can be sought and an attempt made to prevent its further action.

The very nature of the disease, from the standpoint of causative factors and pathology, necessitates emphasis on the hygiene of living. The life which is indicated to be led by such patients should be one of moderation in work, in eating, in exercise, and in personal habits of life ; with emphasis on elimination by bowels, kidneys, skin, and respiratory tracts.

Proper drugs have their place, especially the iodides for their alterative and resorptive effects, while symptomatically the nitrites and sedatives, like the bromides, may be of value. The digitalis and strychnine groups can also be called upon if the heart condition indicates their exhibition.

But in any rational therapy, the elimination of the underlying causes of the sclerosis are, of course, of the greatest importance, and in conjunction with the above measures, cannot be too much emphasized.

CLINICAL MEMORANDA.

AN UNUSUAL COMPLICATION IN SCLERO-CORNEAL TREPHINING.

BY

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I recently attempted to operate on a case of simple glaucoma by Elliot's method.

The conjunctiva was quite healthy, and did not strike one as abnormal in any way. On attempting to raise the flap, I met with great difficulty. By exercising the greatest care, I could raise only a very thin flap indeed, and I did not consider it was thick enough to form a safe covering for the trephine hole, even if I could have succeeded in raising it for the required extent without perforating it. After raising about half the usual-sized flap, I decided to discontinue the operation. I therefore replaced the conjunctival flap and did an iridectomy. The conjunctiva remained injected for a few days longer than is usually the case in sclero-trephining, but otherwise the progress of the case was quite normal.

On investigating the case afterwards, I found the patient had been given two subconjunctival injections of a solution of 1—4,000 cyanide of mercury for a fundus condition a year previously. Patients in India not infrequently suppress a portion of their previous history.

I think it worth while to place this case on record, as here, the injections had so altered the condition of the tissues as to render sclero-corneal trephining, if not impossible, very unsafe, even for an operator who has had considerable experience of this operation and is constantly performing it.

I have trephined all sorts of eyes, but I have never operated on a case in which the conjunctiva was so adherent as in this case.

I have also seen many cases operated on in different clinics in India, England, and on the Continent of Europe, but I have never seen such a case.

I have no doubt, in my own mind, that the condition was caused by the two injections of cyanide of mercury mentioned above.

DYSTROPHY OF CORNEÆ IN TABES.

BY

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In the May number of THE OPHTHALMOSCOPE (p. 292) Mr. A. Levy abstracts a case by Fuchs of this rare condition.

Notes of a similar case which I examined recently may be of interest:

The patient, a man of about 60 years, apparently strong and healthy, complained of failing sight. R. and L. V.=6/18. T.n. Miosis. Argyll Robertson pupils. With ordinary oblique illumination, there seemed nothing amiss in the corneæ, but after dilatation and using the *loupe*, I discovered a large number of greyish, ill-defined, and discrete dots in the posterior layers, giving a mottled appearance to the corneæ.

There were no inflammatory symptoms whatsoever, and the corneal condition being unlike anything I had previously seen, puzzled me greatly. The discs were distinctly pale. A colleague who examined him was unable to detect further signs of tabes. Two months later, vision had sunk to 6/60 with atrophic discs. The corneal appearance was unchanged.

CURRENT LITERATURE.

NOTE.—Communications of which the titles only are given either contain nothing new or else do not lend themselves to abstract.

I.—PHYSIOLOGY.

(1) **Schoenberg, M. J.—Clinical and experimental researches on intra-ocular drainage.** *Archives of Ophthalmology*, March, 1913.

(2) **Henderson, Thomson.—Clinical proof of the venous level of the intra-ocular pressure and a method of estimating the arterial diastolic pressure in the eye and its clinical significance.** *Trans. Ophth. Society U.K.*, Vol. XXXIV, 1914, p. 309.

(1) **Schoenberg,** of New York, has attempted to measure the ocular drainage with the Schiötz tonometer by recording the rate at which the tension becomes lessened when the tonometer is applied continuously. The ocular fluid is gradually expressed by the weight of the tonometer, and this results in gradually lessened tension as recorded by the instrument. He finds that normal eyes show drainage, the tension falling, *e.g.*, from 18·5 mm. to 10 mm. in four minutes. In absolute glaucoma there is no drainage as measured in this way at all. In chronic glaucoma there is a lessened drainage. Schoenberg points out how particularly useful this test may be in cases of suspicious glaucoma. He remarks that the mere fact that the tension of an eye is below 27 mm. Hg. proves nothing, but that if drainage is found to be defective, and the tension in the two eyes is unequal (the eyes having almost invariably equal tension when both are normal), there is reason for diagnosing glaucoma incipiens. Schoenberg found that while in some cases drainage was restored to normal by the use of pilocarpine continuously (in one case under

this treatment, visual acuity and field of vision remained unaltered for a year), in other cases drainage was not improved by pilocarpine, and apparently the two classes of cases can only be distinguished empirically.

By means of further observations, whereby the limits of normal drainage can be determined, Schoenberg's method may prove a useful means ot diagnosis.
ROSA FORD.

(2) As indicated in its title, the suggestive paper by **Thomson Henderson,** of Nottingham, contains two main features, namely, a method of proving that the intra-ocular pressure is that of the intra-ocular veins ; and an account of a method of arriving at an estimate of the arterial diastolic pressure in the eye, together with the clinical significance of a knowledge of such arterial diastolic pressure.

With regard to the first point, we are, to begin with, reminded (1) of the well-known laws regarding fluid pressure ; (2) that veins are elastic, and at the lowest circulatory pressure ; (3) that the venous exit pressure is the lowest circulatory pressure within the eye. From these facts it follows that in the closed corneo-scleral envelope the fluid contents must be at venous exit pressure. If the intra-ocular pressure were greater than the venous pressure, then the veins at their points of exit would be compressed.

Next comes the method of proving to demonstration that if the intra-ocular pressure does rise above the venous pressure, the veins at their points of exit are compressed. The exit of the central retinal vein, as it happens, is the only one of the exits which can be observed. At this point it will be safer to transcribe the author's own words :

" All that is necessary is to observe by the direct method the most proximal portion of the central retinal vein at the disc and note the changes which take place in its lumen as one touches the eyelids, in the region of the external canthus, with the tip of the forefinger of the disengaged hand. One will then note that the moment the finger-tip touches the lid, the lumen of the proximal portion of the vein becomes constricted and will remain so till the finger is removed, when the vessel at once resumes its normal diameter. Two details must be observed to elicit this phenomenon successfully, firstly, the finger must not be placed on the lid before the disc is sighted, and secondly, no pressure must be exerted. The phenomenon is such an extremely delicate one that the mere application, and nothing more, of the finger tip anywhere on the lids will at once produce it, and hence, if the finger is already in position before the veins are under observation, it will be missed, as the veins will be already constricted. The prompt response of the retinal veins to such a minimum pressure, transmitted through the eyelid to the globe, proves how exquisitely balanced are the intra-ocular pressure and the intravenous pressure at the points of venous exit." At this point, the author makes reference to the similarity of the physical conditions which must obtain at the exits of the vorticose veins and in Schlemm's canal. The most suitable cases for observing the phenomenon are those with physiological cupping of the disc. He goes on to say, " the extreme lightness of touch, which will cause constriction of the retinal venous exit, gives one an important indication of the level of the intra-ocular pressure, giving us, in short, the requisite visible proof that the intra-ocular pressure is in equipoise with the venous exit pressure. This fact, of course, does not tell us what the level of pressure in either case is. . . . . The two (pressures) mount together, and under no circumstances can the intra-ocular pressure exceed the venous exit pressure. As external pressure on the globe is increased, the venous pressure rises *pari passu*, first to arterial diastolic level, and finally to arterial systolic level. As soon as this point is reached the intra-ocular circulation ceases altogether." Henderson holds, for reasons which have been discussed in his book on glaucoma, that the intra-ocular pressure, and the intracranial pressure, both stand at the same level, namely, about 10 mm. of mercury. Now, the tension of the globe to palpation is certainly higher than this. The reason for this apparently higher pressure of the eye on palpation is that the act of palpation itself raises the pressure in the way that has just been described. "One can prove this fact clinically by observing the disc in a child or young adult with an electric ophthalmoscope, and at the same time testing the intra-ocular pressure with the fingers of the disengaged hand. As the fingers are placed in position one will at once see constriction of the venous exit, and then, as the globe is palpated, one will note how readily, especially in children, an arterial 'pressure pulse,' such as is typical in glaucoma, can be produced. This pressure, or collapsing pulse, is produced in consequence of the pressure within the eye being now greater than the arterial diastolic pressure of the retinal artery, and hence only the arterial systolic wave can overcome it."

We now come to the author's second point, namely, the estimation of the arterial diastolic pressure by means of a pressure gauge (made by Weiss), which is applied to the eyelid between the external canthus and the orbital margin, while the surgeon sights the disc with a self-illuminating ophthalmoscope. The pressure necessary to produce the collapsing arterial pulse is, in adults between 15 and 25 mm. Hg. That represents 15 to 25 mm. above the venous exit and intra-ocular pressures. With a high general blood pressure it may be higher than this, and with low general pressure the ocular reading may be lower.

Lastly, we have the author's application of the diastolic pressure reading. Here again we shall allow him to speak himself: "Graefe long ago pointed out that lighter digital pressure was required to elicit a collapsing pulse in an eye with glaucoma, or tending to it, than in a normal eye. As less pressure is required in glaucoma, the pressure gauge gives lower readings than in a normal eye, excepting, of course, asthenic cases as already noted with poor circulation and therefore low diastolic pressure. In brief, the principles of the clinical application of the pressure gauge for the determination of glaucoma are as follows: One may take it that the diastolic arterial pressure is the same in both eyes and therefore if a pressure of 20 mm. Hg. produces a collapsing pulse in one eye, while a reading of only 12 mm. Hg., will produce the same result in the other, the difference of 8 mm. Hg. is due to an existing increase of pressure in the second eye. The use of the pressure gauge thus makes it possible to register slight differences of pressure between the two eyes in all cases in which the disc is visible."

In the opinion of the reviewer, no oculist can afford not to read Henderson's paper in the original. The foregoing synopsis will serve to show how interesting it is. ERNEST THOMSON.

II.—COMPARATIVE PHYSIOLOGY.

Freytag, G.—Researches on the light-sense of animals. (**Lichtsinnuntersuchungen bei Tieren.**) *Arch. f. vergleich. Augenheilkunde*, B. IV, Heft ii, S. 151, 1914.

In a recent number of THE OPHTHALMOSCOPE (Vol. XII, p. 287, 1914), we reviewed some researches by **Freytag** (Munich) on the light-sense in animals. The present paper gives the results of his observations on an insect which loves darkness rather than light—the flour beetle (*Tenebrio molitor*). The larvæ were placed in a box, divided into two compartments by a partition, which left a small slit of communication above the floor. Each compartment could be separately illuminated or exposed to different colours by covering it with a sheet of coloured paper rendered transparent by soaking in paraffin. It was first of all proved that the larvæ invariably collected on whichever side was covered. Various colours were then substituted for a simple screen. It was found that the insects showed no preference for one colour rather than another, but always sought the darkest compartment. If one compartment were covered with a blue screen, the other with a red, which to the human eye seemed brighter in clear and darker in dim illumination, the animals always moved towards the red. Similar results were obtained with dark yellow and yellow-green—whichever colour appeared darkest to the human eye under low illumination was preferred by the larvæ. These observations show that it is not the quality, but simply the luminosity of the colour which is of influence; the larvæ manifestly find the same values in coloured lights as are evident to an artificially or congenitally colour blind human observer. Freytag's experiments also prove that the luminosity value of red for the flour beetle is extremely low. Little distinction is made between red light and darkness.

Observations with the spectrum led to the same conclusions.—The animals fly from the green and yellow-green chiefly to the red, partly to the blue; they do not seem to see any difference between red and ultra-red. The results with light reflected from coloured surfaces were the same, and a limited number of observations showed that the imago behaved in the same manner as the larvæ.

The view of Hess, that insects are colour-blind, thus receives the fullest confirmation.

GEORGE COATS.

III.—COMPARATIVE PATHOLOGY.

(1) **Mayou, M. S.—Diseases of the eye in animals.** *Trans. Ophth. Society U.K.*, Vol. XXXIV, 1914, p. 317.

(2) **Menacho, Antonio.—An inflammation of the eyes of fish living in aquaria. (Sobre una oftalmia de los peces de los acuarios.)** *Archivos de Oftalmologia Hispano-Americanos*, Julio, 1914.

(1) According to **Mayou**, of London, congenital malformations appear to be commoner in the eyes of dogs and cats than in those of human subjects. In those animals the author has met with all forms of persistent pupillary membrane, adhesion between the iris and the cornea, pigment on the anterior capsule of the lens, anterior polar cataract, and congenital dislocation of the lens. It would seem that buphthalmos is not at all rare in dogs. In one such case, examined after removal of the eye, Mayou found distension of the globe, aniridia, adhesion of the ciliary processes to the back of the lens, persistent hyaloid artery, and a deeply-cupped optic disc. In other cases he found great distension of the globe, partial aniridia, congenital anterior synechiæ, displacement of the lens and adhesion to the cornea, persistent hyaloid artery, and congenital detachment of the retina.

As regards disease, Mayou reports a case where blindness from optic atrophy in a Samoyede dog appeared to be the direct outcome of hæmatemesis and melæna. In a thin and worried-looking female tortoise-shell cat, which was affected during life with tuberculous irido-cyclitis, Mayou found, after the animal had been killed with chloroform, that the whole of the uveal tract was infiltrated with fleshy and vascular tuberculous nodules. The diagnosis was confirmed microscopically. The primary cause of the eye trouble appeared to be a small localised focus of tubercle in the cat's mammary gland. The last case mentioned by Mayou concerns primary carcinoma of the ciliary body occurring in a Pekinese spaniel. SYDNEY STEPHENSON.

(2) **Menacho** noticed that many fish in the aquaria where he was studying were attacked by a form of panophthalmitis. He was able to cultivate several micro-organisms from the eyes, and found that inoculation was followed by severe inflammation ; the disease of the eyes frequently gave rise to general infection and death. In early stages, incision of the corneæ and evacuation of the contents of the globe might be followed by recovery.

H. GRIMSDALE.

IV.—THE NASAL ACCESSORY SINUSES.

(1) **Onódi, A.—Upon the post-operative defects in vision and blindness of nasal origin. (Ueber die postoperativen Sehstörungen und Erblindungen nasalen Ursprunges.)** *Zeitschrift für Augenheilkunde*, März, 1914.

(2) **Onódi.—Upon contra-lateral visual defects of nasal origin. (Ueber kontralatralen Sehstörungen nasalen Ursprunges.)** *Zeitschrift für Augenheilkunde*, April und Mai, 1914.

(3) **Markbreiter.—Further researches upon the alterations in the field of vision occurring in diseases of the nose and accessory sinuses. (Weitere Untersuchungen ueber die bei Nasen- und Nasennebenhöhlenkrankheiten vorkommen den Gesichtsfeldveränderungen.)** *Zeitschrift für Augenheilkunde*, April und Mai, 1914.

(1) **Onódi**, of Budapest, contributes an interesting article which explains upon anatomical grounds those fortunately rare cases of functional interference with the optic nerve which have developed immediately after or even during intranasal operations. In many instances it has been quite impossible to explain these calamities in the light of text-book relationships between the optic canal and the nasal sinuses, but the brilliant researches of the author have shown that abnormal situations of the various cavities of the nose are quite common. Blindness, or contractions of the visual field, have been recorded after operations upon the frontal sinus, the ethmoidal cells, and the sphenoidal sinus, after resection of the septum, removal of polypi, and conchotomy. Onódi shows that the optic nerve canal may be free in the sphenoidal sinus, and can easily be wounded during a *curettage* of this cavity. An illustration makes this abnormal relationship clear. Another photograph of a beautiful preparation shows the optic nerve canal exposed in a large posterior ethmoidal cell. A study of the illustrations shows how necessary it is to be careful in all intranasal work. Even the forcible extraction of polypi may be followed by optic atrophy and permanent loss of sight in one eye, or by hemianopsia. T. HARRISON BUTLER.

(2) **Onódi**, of Budapest, cites several cases which have been published, and

others which have been studied in his own clinic, in which visual defects have been detected upon the side opposite to the one upon which the nasal disease was situated, and others in which a sinusitis confined to one side of the nose gave rise to alterations in both eyes. The ocular changes were generally manifested by scotomata in the visual field and by the characteristic enlargement of the blind spots. Onódi shows how the anomalies in the relationships between the sinuses and the optic nerves explain these apparently paradoxical phenomena. The six illustrations of beautiful dissections of the nasal area are worthy of careful study. They show almost diagrammatically how, for example, a unilateral empyema of the sphenoidal sinus may implicate the contra-lateral optic nerve, or both optic nerves. It would be most instructive to have an opportunity of studying the original preparations, which must be almost unique.

T. HARRISON BUTLER.

(3) **Markbreiter,** of Klausenburg, has examined 164 cases of empyemata of the nasal sinuses with reference to alterations in the field of vision. He has excluded from these all cases in which the visual acuity was reduced, and cases complicated with fundus changes. The patients were examined in Onódi's Clinic at Budapest. Out of these 100 cases, 63 suffered from disease of the anterior sinuses ; 9 from disease of the posterior sinuses ; and 3 from pansinusitis. In 25 cases treated as out-patients, no accurate diagnosis was revealed ; they were entered as sinus disease.

Seventy cases showed alterations in the visual field, and yet almost all of them had a normal fundus and full acuity of vision. Only in 3 cases was optic neuritis present. In 16 cases the scotoma disappeared after treatment, operative or non-operative. In 4 cases the alterations in the field remained after treatment, and 50 cases did not return to be re-examined. In 52 cases enlargement of the blind spot was detected ; 7 had a central scotoma, and the remaining 11 patients showed peripheral contraction, insular defects, and ring scotoma. In only 28 cases was the enlargement of the blind spot the sole change in the field. In almost half of the 52 examples, it was combined with other defects in the perimetric chart. T. HARRISON BUTLER.

V.—BLUNDERS IN OPHTHALMOLOGY.

(1) **Clarke, Ernest.—Common errors in diagnosis in diseases of the eye.** *Polyclinic*, April, 1914.

(2) **Hepburn, Malcolm L.—Some points in the ophthalmology of general practice.** *Ibidem.*

(3) **Campbell, Kenneth.—Abstract of lecture on "Mistakes in diagnosis of diseases of the eye."** *Ibidem.*

(4) **Clarke, Ernest.—Some errors in diagnosis and treatment in ophthalmic practice.** *Med. Press and Circular*, May 20th, 1914.

These several communications by **Clarke**, **Hepburn**, and **Campbell** respectively deal mainly with the same subject, namely, mistakes liable to be made by general practitioners of medicine in dealing with disorders of the eye. All the papers abound in useful hints. Clarke's second communication, in particular, includes many "tips" about treatment. He also goes somewhat deeply into the question of refraction, and says, in so many words, that "there is no functional nervous trouble that may not be produced by eye-strain." He insists that in children, if astigmatism is present, glasses must be worn always. He advocates the full correction of myopia in young persons, and refuses to prescribe a weaker glass for reading. "Not only do we stay the progress of the myopia by this practice, but in a short time the defect actually tends to decrease." Speaking of presbyopia, Clarke has found that age for age the average individual has more accommodative power than Donders found in his well-known observations upon this point. 'Whenever a patient has considerably less accommodation than normal, Clarke has found signs of pre-senility elsewhere in the body. The prevalent cause of this, in his experience, is intestinal stasis. The moral is obvious, and need not be laboured.

SYDNEY STEPHENSON.

CONGENITAL ANOMALIES.

(*Third Notice.*)

(1) James, R. R.—Crater-like hole in the disc associated with changes at the macula. *Ophth. Review*, February, 1913.

(2) Coats, George.—Congenital mesoblastic strand adhering to and apparently penetrating the cornea. *Proceedings of the Royal Society of Medicine*, March, 1913.

(3) Cobbledick, A. S.—Congenital bilateral deformity of the inner canthus. *Proceedings of the Royal Society of Medicine*, March, 1913.

(4) Gunn, A. Rugg.—Persistent hyaloid artery with massive white formation obscuring the optic disc. *Proceedings of the Royal Society of Medicine*, March, 1913.

(5) Antonelli.—The oval cornea in hereditary syphilis. (La cornea ovale degli eredo-sifilitici.) *Rivist. Ital. di Ottal.*, Aprile, 1913.

(6) Masuda.—A case of peculiar connective tissue strand surrounding the disc. (Ein Fall von eigenthümlichen Bindegewebsstrang um die Papille.) *Klin. Monatsbl. f. Augenheilkunde*, April, 1913.

(7) Stähli, Jean.—The persistence of remains of the fœtal pupillary membrane. (Ueber Persistenz von Resten der fötalen Pupillarmembran.) *Klin. Monatsbl. f. Augenheilkunde*, April, 1913.

(8) Peters, A.—Blue sclera and fragility of the bones. (Blaue Sklera und Knochenbrüchigkeit.) *Klin. Monatsbl. f. Augenheilkunde*, Mai, 1913.

(9) Larsen, Harald.—Deformity of the skull associated with eye symptoms. (Die Schädeldeformität mit Augensymptomen.) *Klin. Monatsbl. f. Augenheilkunde*, August, 1913.

(10) Fleischer, Bruno.—Two cases of unilateral melanosis of the sclera, iris, and fundus, with small wart-like elevations on the anterior surface of the iris. (Zwei Fälle von einseitiger Melanosis der Sklera, der Iris und des Augenhintergrundes mit warzenförmigen, kleinen Erhebungen an der Irisvorderfläche.) *Klin. Monatsbl. f Augenheilkunde*, August, 1913.

(11) **Ruebel, Eugen.—Congenital hypoplasia or aplasia of the anterior layer of the iris. (Angeborene Hypoplasie bezw. Aplasie des Irisvorderblattes.)** *Klin. Monatsbl. f. Augenheilkunde*, August, 1913.

(12) **Calhoun, F. Phinizy.—The report of a case of microphthalmus with orbital cysts (R); partial microphthalmus with intraocular changes (L).** *Archives of Ophthalmology*, September, 1913.

(13) **Begle, Howell L.—Clinical and anatomical report of a case of congenital distichiasis.** *Archives of Ophthalmology*, November, 1913.

(14) **Deutschmann, R.—Bilateral congenital "hole"-formation at the macula. (Doppelseitige angeborene Lochbildung in der Makula.)** Deutschmann's *Beiträge zur Augenheilkunde*, Heft lxxxvii, April, 1914.

(15) **Dougal, Daniel, and Bride, T. Milnes.—A case of cyclopia.** *British Medical Journal*, July 4th, 1914.

(16) **Paton, Leslie.—Congenital malformation of the optic disc.** *Trans. Oph. Society U.K.*, Vol. XXXIV, 1914, p. 301.

(17) **Juler, F. A.—A case of congenital partial ophthalmoplegia.** *Trans. Oph. Society U.K.*, Vol. XXXIV, 1914, p. 301.

(1) The hole, as described by **James**, of London, was situated in the outer half and below the horizontal meridian of the optic disc; the reflex from it was of a slatey-blue colour. At the macula was a yellowish area with fine pigment around. A bibliography of the condition is appended.

A. H. PAYAN DAWNAY.

(2) The short article, by **Coats**, of London, describes the following conditions: "Male infant, aged six weeks. The left globe is microphthalmic. In a downward and inward direction a thick, fleshy mass arises in the region of the lower fornix, and passes upward and outward to become adherent to the cornea in its inferior internal quadrant to the extent of about one-third of the corneal diameter. The mass is covered with mucous membrane, and shows no dermal elements; it is not possible to pass a probe beneath it. The eyelids are perfectly formed, and the caruncle is present and normal. Elsewhere the cornea is clear. The pupil is displaced downwards and inwards to the seat of attachment of the fleshy mass, so that only a narrow rim of black is visible on looking in from above. The iris seems to be of fairly normal texture, but its surface is everywhere covered with a radially disposed system of fine red vessels, which form some irregular arcades near the pupillary margin. In the right eye, which is probably of normal size, there is a superficial vascular opacity encroaching slightly on the cornea in a downward and inward direction, corresponding in situation with the adhesion in the other eye. There is a normal anterior chamber, however. The pupil is displaced downwards aud inwards, and is slightly elongated vertically. Beneath it, in the usual position, is a partial coloboma of the stroma, the pigment epithelium being apparently intact. The coloboma and the corneal opacity are not opposite each other, the opacity being farther inwards. In this eye also the surface of the iris is covered with radiating vessels, having arched communcations at the circulus minor. No coloboma of the choroid could be seen, but examination was difficult."

The author considers the possible causes of this condition to be inflammation, maldifferentiation of the mesoblast of the fœtal cleft, and amniotic constriction and band formation. He seems to lean, on the whole, to the third of these possible explanations in this case. ERNEST THOMSON.

(3) The condition reported on by **Cobbledick**, of London, seems to have been more or less of a family defect, since the mother, one brother, two sisters, and a child of the patient, had the same defect. The deformity in the patient himself, a man aged 39 years, consisted essentially in enlargement of the lacus lacrymalis, which, instead of being triangular in shape, was somewhat oval, so that the vertical and lateral measurements of the lacus were much greater than normal. The lacrymal papillæ were very prominent. There were marked flattening of the malar bones and smallness of the palpebral fissures, the latter partly from ptosis and partly from an abnormally short lateral measurement. An appearance of internal strabismus was thus produced. Epiphora was gradually getting worse. No other congenital defects.

ERNEST THOMSON.

(4) The description of this case by **A. R. Gunn**, of London, is accompanied by a coloured plate, which is essential to a proper appreciation of the appearances.

ERNEST THOMSON.

(5) There have been very few observations of oval cornea, says **Antonelli**, of Paris, and yet the association of this condition with hereditary syphilis is well recognised. In one of the few preceding papers, the oval cornea, with long axis vertical, was found in connection with oxycephaly, and this is specially interesting since it affords evidence that the "tower skull" is one of the stigmata of syphilis.

Antonelli, in the present paper, gives notes of five cases of oval cornea, all of whom were the subject of hereditary syphilis, and most the seat of parenchymatous keratitis.

There is a distinction to be drawn between the eyes which show crescentic patches at the sides (embryontoxon, or arcus fœtalis) and these oval cornea of which Antonelli speaks ; the former are the scars of intra-uterine sclerosing keratitis : the latter are the result of arrest of development at a late stage of fœtal life ; this explains the frequent association with microcornea. The two conditions may co-exist ; one of the cases referred to in the paper, had a vertically oval cornea and a small patch of sclerosis of fœtal date in the infero-temporal quadrant.

"I was much surprised," says Antonelli, "in one of my early cases to find that a cornea which appeared to the naked eye undoubtedly oval was really circular, and that the measurements of the two diameters, vertical and horizontal, were exactly the same." He had not taken into account the fact that the normal cornea, although it appears circular, is really oval, with the long axis transverse, and that any increase of the vertical diameter, even though it did not pass the measurement of the horizontal, would give the cornea an abnormal appearance. Similarly, circular lenses are very often supposed to be elliptical, with the long axis vertical.

HAROLD GRIMSDALE.

(6) In the case recorded by **Masuda**, of Tokio, a fine white connective tissue strand was seen surrounding the disc in an irregular manner. From its lower and outer part a fine branch passed down and out in the retina, and from another point three narrow strands passed forwards into the vitreous. There was no trace of past inflammation or other disease. The author thinks it may be the remains of an obliterated vessel of an abnormal kind in the vitreous.

A. J. BALLANTYNE.

(7) **Stähli**, of Zürich, gives the results of a special investigation of 800 cases (1,600 eyes) with a view to discovering the frequency with which remains of the pupillary membrane can be found.

Remains of some kind were found in one or both eyes in 60·6 per cent. of male patients and in 64·9 per cent. of females, average 63·25 per cent. They were found in 45·1 per cent. of the examined eyes. Two forms of rests were found, namely, threadlike and punctate (Schubert's "pupillary sand"). The latter was the more frequent, being found alone in 27·6 per cent. of the eyes examined, while thread-like rests alone were found in only 7·3 per cent. Both forms were found together in 3·2 per cent.

Remains of the pupillary membrane are relatively rare in older people. They are found more frequently in myopes and emmetropes than in hypermetropes, and more frequently in the presence of astigmatism than in its absence. Although the thread form is seen more often in light than in dark eyes, the remains, as a whole, are more common in dark eyes. Their occurrence is more frequent in eyes in which the lesser circle of the iris is prominent. The author could trace no hereditary influence.

A. J. BALLANTYNE.

(8) **Peters**, of Rostock, was, in 1908, able to show that blue sclera, due to thinning of the wall of the eye, might be a hereditary congenital anomaly. Recently, in reinvestigating the family in question, he ascertained that fractures of bones, from very trifling causes, had appeared in several members of the family. At the date of his original publication, attention had not yet been called to the association of blue scleræ and fragility of the bones. He agrees with the view of Eddowes that the two anomalies are related through a defect in the fibrous structures. There is no cure for the condition, but the subjects of the scleral anomaly should be warned early, and should not be allowed to indulge in strenuous sports or occupations. A. J. BALLANTYNE.

(9) According to the experience of **Larsen**, of Copenhagen, 21 per cent. of the boys in the Institution for the Blind in that town are affected with the condition known as "tower skull." Adding to these a few cases seen elsewhere, he is able to base his remarks on some nineteen cases of the disease in its fully developed form ; but the chief object of his paper is to point out the characters of the disease in its earlier stages, when it is not so likely to attract notice, and he is able to present four cases which are of interest in this connection. The high cranium, the digital impressions, the bony ridges, and the prominence at the site of the anterior fontanelle, as well as the eye symptoms—exophthalmos, strabismus, and nystagmus—are the well-known evidences of the fully developed condition ; but it is loss of vision that usually directs the patient to the physician, and the history of these cases shows that very often this defect has been noticed at a period long before the deformity of the skull was such as to attract attention. The visual failure usually commences from the first to the third year, is often associated with acute cerebral symptoms, and sometimes a history of antecedent injury is given. As a rule, by the time the physician sees the patient, ophthalmoscopic examination shows post-neuritic optic atrophy.

The following are brief notes of three cases which the author believes to represent the initial stages of the affection.

Case I.—Aged 2 years 10 months. History of injury six months before, and failing vision fo four months. Vision very defective, optic atrophy, exophthalmos, and strabismus divergens. There was a thickening of the anterior fontanelle, which had apparently been noticed before the date of the accident.

Case II.—Aged 4 years. Did not walk till age of three, speech undeveloped, almost blind for six months. Evidence of rickets, imbecile appearance, convergent squint, post-neuritic optic atrophy, bony thickening over the anterior fontanelle.

Case III.—Aged 4 years. History of headache, vomiting, dulness, and uncertain gait for three or four months. Exophthalmos, divergent squint, post-neuritic atrophy of the optic nerves, amaurosis. Evidences of past rickets. There was an exostosis at the middle of the coronary suture.

In all three cases the form of the cranium was normal, with the exception of the bony prominence over the anterior fontanelle. The importance of this deformity, in the author's opinion, is that it is the earliest recognisable sign of this disease. If, in a child complaining of visual failure, we find this unusual growth, we are justified in assuming that we are dealing with a case of "tower skull" in its initial stage. To lend confirmation to this view the author quotes a fourth case, that of an inmate of the Institution for the Blind, who in early childhood had suffered from a progressive loss of vision, accompanied by the occurrence of fits and the growth of a bony thickening in the position of the anterior fontanelle. Ten years later, when the patient died of septic meningitis, the skull presented all the characteristics of "tower skull." As bearing on the question of the cause of the loss of vision in these cases, it is noted that sections showed no narrowing of the optic foramen or other evidence that blindness was due to pressure on the nerve.

Larsen thinks that the bony prominence, to which he attaches so much importance, is probably brought about by the action of elevated intracranial pressure at a time when the tissue is still soft, *i.e.*, before ossification has occurred. He believes that high intracranial pressure is present at some period in all the cases, and that it is the primary cause of the optic atrophy.

The paper comprises also a review of fifteen cases of "tower skull" in its fully developed form, along with remarks on the treatment of the affection.

A. J. BALLANTYNE.

(10) The patient reported by **Fleischer**, of Tübingen, was a child, three and a half years of age, who presented in one eye a pigmented band surrounding the cornea, of an average width of 5 mm. The iris of the same eye was of a darker brown than that of the other, presented a thickened appearance, and had no distinguishable lesser circle. Its surface was covered with small wart-like prominences. The fundus was much darker than that of the unaffected eye, deeply and uniformly pigmented, while the other fundus was of a paler red, with choroidal vessels showing in places. The hair of the head, eyebrows, and eyelashes was a "dark blonde."

The child's parents were cousins. It was thought that the condition had made its appearance during the first year of life, as a single dark spot, and increased in extent during the period of pigmentation of the eye.

The condition is non-malignant, but may undergo a malignant transformation. Sometimes it is associated with melanotic sarcoma. A. J. BALLANTYNE.

(11) **Ruebel**, of Freiburg i. Br., describes and figures the irides of a man, aged 19 years, who had never suffered from any disease of the eyes, but was aware that one eye, the right, was more defective than the other. There was no evidence of past inflammation, but the anterior chambers were deep, and the irides presented an unusual appearance. They were of deep-brown colour, and in the lower half of each there was a light-coloured band, of zig-zag form, lying midway between the pupillary and ciliary borders of the iris. Seen under high magnification, a delicate tissue composed of fine filaments was found to lie in front of the dark-brown surface of the iris. The fundi were deeply pigmented, and there was a downward crescent in each disc. The right eye was amblyopic. The author came to the conclusion that the brown surface which formed the background of the picture was the pigmented epithelium of the iris, while the delicate tissue of threads lying in front of it was all that represented the iris stroma. When the eye was transilluminated, almost as much light came from the iris as from the pupil. This he takes as support for his view that it is chiefly the stroma of the iris that influences the amount of light transmitted on transillumination. Another point of interest is that the pupillary reactions were lively, and the effect of cocaine as a mydriatic was normal. This would not have been the case were Münch's theory correct, namely, that the dilator mechanism lies in the stroma of the iris. Two

possible explanations of the condition are mentioned, namely, intra-uterine inflammation and developmental defect. The author favours the latter.

A. J. BALLANTYNE.

(12) **Calhoun,** of Atlanta, Georgia, examined histologically the one eye of a negro boy aged six years, which was microphthalmic with an orbital cyst, and made a careful examination of the fundus of the other eye, which was microphthalmic without a cyst. From the result, he concludes that the condition was due to prenatal inflammation of embryonic tissues. The histological findings consisted of displaced lens, calcareous degeneration of both lens and vitreous, cornea slightly vascular with some new-formed connective tissue, the iris converted into a disorganised mass, a shallow anterior chamber, patches of bone in the choroid, retina fused with the choroid in places, sclera thick, cyst wall of connective tissue similar to sclera, cavity connected with that of the eye by remains of fœtal cleft, lumen containing retinal tissue and choroid pigment. The ophthalmoscopic findings were posterior capsular cataract, white glistening bands in the vitreous, disc represented by a dark conglomerate area to which vessels converged, and from which radiated bands of white shining connective tissue into the vitreous, black pigment spots in the retina, like retinitis pigmentosa, a few white spots in the (?) retina, and some (?) old retinal detachments. With this eye, the boy could find his way about in strange places, and recognise large objects.

ROSA FORD.

(13) **Begle,** of Detroit, Mich., states that he has discovered 25 cases of congenital distichiasis in the literature. At Prague, among 50,000 eye patients, only one case was observed. In the present case, the distichiasis was present in all four lids, but was incomplete; the lashes were well developed, black, and 3 mm. to 5 mm. in length. The anterior cilia were normal. The right cornea was clear, but the left showed ulcers and opacities. There were a number of gland openings in line with the abnormal cilia, small but sebum-like material exuded. There were no outlines of the Meibomian glands, but some yellowish punctiform structures were seen through the conjunctiva irregularly placed parallel with and near to the lid margin. Pathological examination showed an absence of the Meibomian glands and their replacement by hyperplastic sebaceous glands discharging into the follicles of the accessory cilia, and well-developed small simple independent sebaceous glands irregularly scattered beneath the lid margin and opening upon the surface. There was no hyperplasia of the modified sweat glands.

Begle explains the phenomenon as atavistic. Eggeling states that the Meibomian glands in most primitive forms (*Igel* and *Ornithorhincus*) are still in union with hair follicles. Ask also says that at a time when the caruncle is embryologically a part of the lower lid, the "anlagen" of its hair follicles and sebaceous glands is in line with the "anlagen" of the Meibomian glands. Begle excised the follicles of the accessory cilia and transplanted some mucous membrane from the lip in their place, with a very successful result.

ROSA FORD.

(14) **Deutschmann,** of Hamburg, has been able to trace in the literature only four cases in which a macular hole was probably congenital. The case which he now puts on record, a man 21 years of age, presented the typical picture of a macular hole in each eye. There was no history of injury, and bodily illnesses could be excluded, but the parents were blood relations. V.R. = 5/12, V.L. = 5/10. There was neither central nor paracentral scotoma, but the patient complained that in the dusk he could see people at a distance only with excentric fixation, and the field of vision was much contracted in its upper part under reduced illumination. The author looks

upon his case as one of slight retinal atrophy, manifested by the hemeralopic defect in the upper field and the macular change; related to the group of cases of congenital night blindness without pigmentary degeneration which are believed to be due to a slight congenital atrophy of the retina. That even the macular atrophy was not complete in this case was shown by the relatively good central vision, and it is noteworthy that this condition can accompany the typical picture of a macular hole. A. J. BALLANTYNE.

(15) The case of cyclopia reported by **Dougal** and **Bride**, of Manchester, concerned a stillborn male, weighing 5½ lbs. The eye, contained in a single large orbit, was made up of two globes, fused together in the middle line and having a median groove above and below. With the exception of the internal recti, all the extrinsic muscles were present. There were two corneæ, through which could be seen the iris, enclosing a circular pupil. The eyes were complete units, and perfect as regards their component parts except at their junction, where the sclera and choroid were absent; that the retinæ were thrown into folds; and, finally, that the optic nerves were fused. The sclera which separated the two corneæ was covered with conjunctiva, and "overlying the middle portion of this was a tough fibrous band, half an inch in width, and running from the proboscis above to the junction of the fused lids below." The lacrymal papillæ were present.

It should be added, lastly, that the mother had previously given birth to eleven normal children. SYDNEY STEPHENSON.

(17) The case brought forward by **F. A. Juler**, of London, was in a lad, aged 8 years, whose left eyeball had presented some peculiarity since birth. The eye had no power of movement except upwards, and on looking towards the right, the left eye became slightly retracted. The right eye showed "slight weakness of abduction." SYDNEY STEPHENSON.

VII.—INTRA-OCULAR HÆMORRHAGE.

(1) **Moissonier.—Two cases of recurrent intra-ocular hæmorrhage of adolescents. (Deux cas d'hémorragies intra-oculaires récidivantes des adolescents.)** *Archives d'Ophtalmologie*, avril, 1911.

(2) **Cords, R.—A contribution to our knowledge of juvenile diseases of the retinal vessels. (Zur Kenntnis juviniler Netzhautgefässerkrankungen.)** *Zeitschrift für Augenheilkunde*, November, 1911, and Dezember, 1911.

(3) **Davis, Edward A. (New York).—Recurrent retinal hæmorrhages occurring in the young, with the report of a case.** *Archives of Ophthalmology*, September, 1912, and *Trans. Amer. Ophth. Society*, Vol. XIII, Part 1, 1912.

(4) **Pollock, W. B. Inglis.—Intra-ocular hæmorrhage.** *British Medical Journal*, October 19th, 1912.

(5) **Chevalier.—A note on sudden and recurrent vitreous hæmorrhage, and contribution to the study of this variety of intra-ocular hæmorrhage. (Observation d'hémorragie subite et récidivante du corps vitré et contribution à l'étude de cette variété d'hémorragie intra-oculaire.)** *L'Ophtalmologie Provinciale*, janvier, 1913.

(6) **Steffan, Rose.—On periphlebitis retinalis. (Ueber Periphlebitis retinalis.)** *Archiv f. Augenheilkunde*, November, 1913, S. 299.

(7) **Gilbert.—On juvenile vascular diseases of the eye. (Ueber juvenile Gefässerkrankungen des Auges.)** *Neununddreissigste Bericht der Ophthalmologischen Gesellschaft*, Heidelberg, 1913.

(1) Two cases of recurrent intra-ocular hæmorrhage are reported by **Moissonier**, of Tours, due, in his opinion, to toxæmic causes, in one from a chronic buccal affection, arising from carious teeth, and in the other from acquired syphilis. BERNARD CRIDLAND.

(2) Axenfeld and Stock have grouped several diseases, which were before considered to be independent conditions, under the heading *Angiopathia retinalis juvenilis*. Into this category they place periphlebitis retinalis, recurrent hæmorrhages into the vitreous, retinitis proliferans, and disease of the retina with massive exudation. These two ophthalmologists have suggested that tuberculo-toxæmia plays an important part in the ætiology of this group of diseases.

Cords, of Bonn, in the present paper cites cases which lend support to this view, for he not only in several instances got a reaction after injection of old tuberculin, but also in some cases was able to record an improvement under treatment with tuberculin.

The first disease considered is uncomplicated periphlebitis retinitis, also a rare disease, when not associated with hæmorrhage into the vitreous. A case is recorded of a young man with recurrent hæmorrhages into the vitreous on one side, while the other eye showed a periphlebitis with small retinal hæmorrhages. A reaction was obtained to tuberculin, which was followed by rapid improvement in all the symptoms. The periphlebitis is characteristic : there are yellowish-white deposits along the vessels, a white sheath, and punctate hæmorrhages. A second case, similar in character, is recorded, and fifteen cases are analysed in tabular form. The author now passes on to the consideration of recurrent vitreous hæmorrhages, recording three unpublished cases. A tuberculin reaction was obtained in the first and second cases, and in the third a tuberculous iritis was present with the vitreous hæmorrhages. Cords thinks that the association of vitreous hæmorrhages with tuberculosis can no longer be doubted.

The last portion of the paper deals with proliferation of connective tissue in the juvenile retina. Full justice is done to the splendid work accomplished by George Coats in this branch of pathology. T. HARRISON BUTLER.

(3) Beyond the fact that he had lost flesh during the previous four months and that he did not look well, a thorough examination of **Davis**' patient, a young man of 22 years, revealed no abnormality. Wassermann was negative. He was at college, and had worried over his studies a good deal and suffered from nervous indigestion. Neither his past history nor his family history indicated tuberculosis, except that his father, when a young man, had been sent to the mountains on two occasions for some months for delicacy. The tuberculin test was, however, positive. Repeated and extensive hæmorrhages occurred in both eyes, and there was a most pronounced peri-vascularitis, especially affecting the veins, followed by proliferating retinitis, vascular veils, and vitreous opacities, with almost total loss of vision in the right eye and vision reduced to 20/40 in the left. Treatment either by absolute rest, or with moderate exercise, appeared to exercise no influence whatever on the recurrence of the hæmorrhages, and the credit for any good result obtained seems to be due to open-air treatment, tuberculin injections, and general hygiene, although a note at the end of Davis' paper

tends to throw doubt even upon these methods, inasmuch as a detachment of the retina occurred later still in the left eye, reducing vision to the counting of fingers at 10 feet.

That tuberculosis was an ætiological factor seems certain from the decided reaction to tuberculin. Davis thinks that auto-intoxication is also a factor, from the facts that there had been indigestion, that there was at times a large excess of indican in the urine, and that at one time there was an acute desquamative involvement of the kidneys, lasting between two and three weeks. Davis notes that the hæmorrhages seemed to come from the retinal veins and arteries, and not from the choroidal veins. The patient's blood-pressure and blood tests were normal throughout.

ROSA FORD.

(4) **Pollock**, of Glasgow, gives an account of the various types of intra-ocular hæmorrhage.

(5) **Chevalier**, of Le Mans, in a communication to the French Ophthalmological Society (May, 1912), reported the case of a man, aged 25 years, with vitreous hæmorrhages following on epistaxis. There was no history of syphilis, and his general health was good. He was put on Abadie's treatment, *viz.*, cinchona, perchloride of iron and citric lemonade, also ergotin internally; there was no improvement, and the vision fell to perception of light in the affected eye (the left). Two years afterwards he had a hæmorrhage in the right eye, again following on an epistaxis, vision 1/20, tension normal, pupil dilated, fundus not visible. Examination of other organs normal; Wassermann positive. Chevalier prescribed antisyphilitic treatment. Two months afterwards Wassermann negative, but Hecht-Weinberg positive, showing that the condition was certainly syphilitic. Specific treatment was continued. As the patient resided at some distance, salvarsan was not tried, but hectine, hectargyre, and benzoate of mercury injections were used. Vision improved to 5/10, and the patient was able to return to work. There was no improvement in the left eye.

Chevalier points out that the condition is met with chiefly in young males, and that the hæmorrhage arises from the choroidal capillaries or the peripapillary venules or the branches of the central artery or vein of the retina.

P. A. HARRY.

(6) While periphlebitis retinalis tuberculosa has now become more often recognized, **Rose Steffan**, of Munich, writes that it was Gilbert who first drew attention to the fact that in this condition the optic nerve may also become involved. Gilbert reported the atrophy of the optic nerve in a male of twenty years, where there was only one retinal hæmorrhage, and no visible vessel-wall disease of the retina. Siegrist then compared two types of this disease. In the one form the optic nerve and the principal branches of the central vein are entirely normal and the inflammatory periphlebitis changes are found in the smallest branches of the retinal veins in the periphery. In the other form the periphlebitic changes occur in the principal branches of the central vein, with an optic neuritis. Steffan gives the details of a case of the latter type, with participation of the optic nerve, and thickening of the end branches of the veins. The course was interesting, in that during several months' observation, there appeared many vitreous and retinal hæmorrhages. The case forms evidence, therefore, for the supposition of Gilbert, that circulatory derangement occurs on the stem of the central vein with involvement of the optic nerve. The second case reported is of interest, because of the ætiology.—The twenty-three year old J. N., acquired lues a year ago. Two months previous to the examination, there occurred sudden disease of the left eye, when retinal hæmorrhages were found. The patient

was put upon antisyphilitic treatment. When the patient was seen by Steffan, a diagnosis was made of right, hæmorrhagica retinalis, periphlebitis retinalis; left, retinitis proliferans. This is the first typical case since Axenfeld and Stock's report on the tuberculous nature of this disease, which has been shown to be due to acquired lues in the secondary stage. As, in the older literature, there has been occasionally reported the appearance of retinitis proliferans after retinal bleeding in young syphilitics, so syphilis must be considered as an ætiological factor in rare cases. HANFORD McKEE.

(7) **Gilbert**, of Munich, said that in recent times much attention had been given to juvenile diseases of the ocular blood vessels, especially those of the retina. Typical examples are retinal periphlebitis, retinitis exudativa, and angiomata of the retina. In about 20 per cent. of these cases the uvea is secondarily affected. The iritis is generally unilateral, and sometimes follows years after the primary retinal disease. The author proceeded to describe cases of severe iridocyclitis following retinal vascular disease. One case was anatomically examined, and a section of the optic nerve is shown in the article. The chief change was a neurophlebitis of the central vein behind the lamina cribrosa. Gilbert thinks that these diseases have a tuberculous basis.

T. HARRISON BUTLER.

VIII.—INJURIES OF THE EYE.

(Second Notice.)

3.—Projectiles.

(1) **Ewing, A. E. and Hoge, M. W.—Gunshot injury of the globe and orbit; two bullets in the brain.** *American Journal of Ophthalmology*, February, 1911.

(2) **Elliot, R. H., Major I.M.S.—Native gunpowder injuries of the eye.** *Indian Medical Gazette*, Vol. XLVI, p. 100, March, 1911.

(3) **Gross, Julius H.—Very extensive direct rupture of the choroid and retina from a gunshot.** *American Journal of Ophthalmology*, April, 1911.

(4) **Cosmettatos, G. F.—Direct and isolated injury of the optic nerve by shot grains. (Blessure directe et isolée du nerf optique par grains de plomb.)** *La Clinique Ophtalmologique*, 10 juin, 1911.

(5) **Cohn, P.—Dart-shot injury of the eye. (Pfeilschussverletzung des Auges.)** *Wochenschrift f. Therapie u. Hygiene d. Auges*, November 2, 1911.

(6) **Bosch, van den.—Dart shot injury of the eye. (Pfeilschussverletzung des Auges.)** *Wochenschrift für Therapie u. Hygiene d. Auges*, November 16, 1911.

(7) **Oguchi, Ch.—On double perforation of the eyeball by the modern small-bore coated projectile. (Ueber die Döppelperforation des Auges durch das moderne Kleincaliber-Mantelgeschoss.)** von Graefe's *Archiv f. Ophthalmologie*, Bd. LXXX, Heft ii, November 7, 1911.

(8) **Terson père.—Severe war injury causing the destruction of one eye and simulated sympathetic ophthalmitis. Condition of the second eye thirty-seven years after the extraction of a foreign body from the lens and an adherent cataract. (Grave blessure de guerre ayant entrainé la destruction d'un œil et simulé une ophtalmie sympathique. Etat du second œil trente-sept ans après l'extraction d'un corps étranger crystalien et d'une cataracte adhérente.)** *Ann. d'Oculistique*, janvier, 1912.

(9) **Hoeve, J. van der.—Eye injuries caused by blank cartridges. (Augenverletzungen durch Exerzierpatronem).** *Klin. Monatsbl. f. Augenheilkunde*, August, 1912.

(10) **Lange, O.—Cases of eye injury. (Zur Kasuistik der Augenverletzungen.)** *Klin. Monatsbl. f. Augenheilkunde*, November, 1912.

(11) **Hesse, Robert.—A case of unusual shot injury. (Ein Fall von seltener Schrotschussverletzung. Beitrag zur Kenntnis des Faserverlaufes im Tractus opticus.)** *Klin. Monatsbl. f. Augenheilkunde*, Juli, 1913.

(1) This case of gunshot injury reported in full as to eye and nerve symptoms does not lend itself to abstract.

(2) **Elliot**, now of London, describes the effects of injuries of the eye by the explosion of native Indian gunpowder used for fireworks. The powder contains a mixture of red sulphide of arsenic (realgar) and chlorate of potash. The cornea and conjunctiva are found studded with particles of the red sulphide. The skin of the face is similarly sprinkled, and rarely some grains are driven through the cornea and embedded in the lens and iris. The particles can rarely be picked out from the cornea with a needle or spud. Their extraction is often only possible at the expense of extensive damage to the surrounding tissue. Consequently, there is little to be done; as a rule, only when the granules are comparatively few and large can they be laboriously dissected out at repeated sittings. The embedded salt is chemically irritating, setting up marked ciliary congestion. Chronic irido-cyclitis follows, not infrequently ending in loss of vision.

The reviewer has unpleasant memories of such cases—cases in which little or no good was done by treatment, and which passed on sooner or later into other hands. In one long-continued case, large translucent follicular elevations developed in the retrotarsal folds of the conjunctiva. H. HERBERT.

(3) **Gross**, of St. Louis, expends a considerable amount of time in detailing the ordinary clinical appearances of rupture of the choroid. He states that in spite of the great number of cases reported, the diagnosis has twice only been confirmed by anatomical examination, *viz.*, by von Ammon in 1855 macroscopically, and by A. Alt in 1897 microscopically. Assuming that Gross has not missed anything in his study of the literature, this is a most surprising state of affairs. Gross then quotes at length from these descriptions by von Ammon and Alt, and finishes up by describing the clinical appearances in his own case. Inasmuch, however, as this case did not come to pathological examination either, we are not much further advanced in our knowledge. ERNEST THOMSON.

(4) In the case reported by **Cosmettatos**, of Athens, it is supposed that the shot penetrated the orbit and divided the optic nerve without doing any other orbital or ocular damage. The literature on the subject of such injuries is referred to. ERNEST THOMSON.

(5) **Cohn**, of Berlin, reports the case of a boy of four who had been shot

in the right eye by a dart a quarter of an hour before being brought to the clinic. Under anæsthesia, the dart was found plugging a 5 mm. wound 3 mm. upward and outwards from the cornea. The pupil was displaced towards the wound, but there was no hæmorrhage. A slight loss of vitreous accompanied the extraction of the dart, which measured 25 mm. in length, the metal portion being 16 mm. and the tuft of hairs 9 mm. The dart had penetrated 22 mm. into the vitreous. Vision was lost by a large separation of the retina. Cohn's suggestion that the vitreous in children possesses a strong resistance to infection, while seemingly occasionally true, is scarcely borne out by the present case. A deeply depressed scar with low tension would indicate that the weeks of reaction were due to a sub-acute iridocyclitis.

A short review of the previously published cases accompanies the paper.

W. B. INGLIS POLLOCK.

(6) **van den Bosch,** of Düren, reports a case of injury of the eye by a dart.—The boy, 13 years of age, had watched through a key-hole in a door while the other boy aimed at it, with the result that an exact shot penetrated his eye. The dart was of the same dimensions as in Cohn's case, but had entered through the cornea. The wound measured 5 mm. and there was iris and vitreous prolapse, the dart having penetrated as far as the tuft of bristles. The anterior chamber and the vitreous contained large hæmorrhages. When two days later it was considered necessary to draw off the lens on account of rise of tension, the patient was taken from hospital. It was learned that this operation was later undertaken elsewhere. W. B. INGLIS POLLOCK.

(7) During the Russo-Japanese war 1904-5 the number of injuries to the eyes amongst the Japanese was 3,093, out of which 1,605 were due to rifle wounds and 771 to shells. **Oguchi,** of Tokio, shows how the small-bore weapon has changed the surgical aspect of the injuries to the eye. While formerly shot wounds produced wholesale destruction with escape of the greater part of the contents of the globe, now the smaller ball leads sometimes and under certain conditions to clean perforating wounds of the eyeball, the place of entrance and egress being curiously small. R. GRUBER.

(8) **Terson,** of Toulouse, records the case of a man who, during the Franco-Prussian war of 1870, was struck by a bullet which destroyed his left eye and all the bones of the nose between the eyes. Soon afterwards his right eye became inflamed, and went gradually blind owing to traumatic cataract caused by a small foreign body which had penetrated the cornea and lodged at the pupillary margin of the iris. The foreign body, which was adherent to the iris, was removed by iridectomy and the lens was extracted after much difficulty had been experienced in tearing the very tough capsule. The man, who was illiterate, got sufficient vision for his purposes, and thirty-seven years later (in 1911) his sight was even better than immediately after the operation and his hypermetropia had diminished from 10 D. to 5 D.

The case is of interest, as it was regarded as one of sympathetic ophthalmia and looked upon as hopeless for four years, and also owing to the difficult nature of the operation in pre-cocaine days. R. J. COULTER.

(9) That the cartridges used during military manœuvres are not free from danger, even in the course of their legitimate use, is shown by the statistics of the Austrian and French armies, the former showing in one year as many as forty to fifty accidents, seven of them fatal, and the latter fifteen to twenty serious, and one or two fatal accidents each year. As the cartridges are sometimes taken by the recruits to their homes, accidents due to their use, or rather abuse, are also met with among the civil population. Since these cartridges are intended to give the noise, recoil, etc., of the ordinary ammunition, but without the projectile, they contain a full charge of the

explosive. In place of the bullet there is a hollow wooden ball which bursts on leaving the rifle, its particles being scattered around within a range of about seven metres.

The author, **van der Hoeve**, of Utrecht, describes two cases of eye injury from such cartridges. In the first the eye was at a distance of two or three metres from the rifle. A piece of wood from the ball passed through the cornea and lens into the vitreous. When removed it was found to weigh six milligrammes. Deep inflammation ensued. In the other case two small splinters of wood were impacted in the cornea and bulbar conjunctiva. They led to an ulcus serpens from pneumococcus infection.

van der Hoeve, in order to determine the danger zone for the eye in relation to blank cartridge explosions, contrived some experiments which showed that at a distance of four metres the splinters of the wooden ball could penetrate the coats of the eyeball, and that up to six metres fragments could become impacted in the cornea and sclera. Particles of unburnt powder may also, up to a distance of two metres, perforate or become impacted in the cornea, but, as a rule, they are well tolerated by the eye. The metal capsule itself may burst, the eye being injured by splinters of copper, and this has been the cause of many serious eye injuries where the cartridges have not been fired in a rifle but exploded in play. The danger is greater in these cases, since the splinters of wood and metal scatter in all directions. Lastly, at a distance of a few centimetres from the mouth of the rifle, the eye may be burnt by the flame, or even perforated by the force of the gas resulting from the explosion. A. J. BALLANTYNE.

(10) In this communication **Lange**, of Brunswick, gives details of the following cases:—

1. A case in which a chip of metal lodged in the optic nerve head, causing great shrinkage of the visual field.

2. A case in which, three years after an injury, a chip of copper, 1 mm. by ½ mm., could be seen at the centre of the lens, the lens being free from opacity and the vision good (1/3 to 1/2).

3. A case showing spontaneous disappearance of a partial traumatic cataract.

4. A case of gunshot injury in a boy of 16 years. The shot, 6 mm. in diameter, was fired from a revolver at a distance of 1/4 metre. The wound of entrance was at the inner end of the upper lid, and there was no wound of exit. The radiogram showed a flattened bullet in the posterior part of the nasal side of the orbit. There were chemosis, exophthalmos, mydriasis, hyphæma, blood in the vitreous, and vision was reduced to *nil*. After clearing up somewhat, there was recurrence of the hyphæma. The interesting features of the case were the recurring hyphæma, and the fact that with such a large projectile coming from such a close range there was no evidence of injury to the orbital nerves and muscles and no penetration beyond the apex of the orbit.

5. Another boy, two years old, accidentally shot by a 6 mm. rifle. The ball entered in the right temple, 2 mm. behind the external orbital margin. On the right side there was exophthalmos, chemosis, and a small retinal hæmorrhage. The media were clear. On the left side there was more pronounced exophthalmos and chemosis, and several small retinal hæmorrhages. A radiogram located the ball in the lower angle of the outer part of the *left* orbit, and it was then felt in this position, under the skin, and easily excised The eyes were well, both functionally and objectively, in fourteen days. A. J. BALLANTYNE.

(11) The patient, whose case is reported by **Hesse**, of Gratz, a man of 47 years, received an injury in the neck by a single small shot, the wound of

entrance being on the left side of the neck above the middle of the posterior border of the sterno-mastoid. A large hæmatoma developed in this region. According to his story, at the moment of the injury he saw a flash before his eyes and then for a moment could see nothing. Later he found that there was a gap in his field of vision below and to the right side. Hesse found no abnormality in the eyes, objective or subjective, except a symmetrical sector-shaped defect in the lower right quadrant of each field of vision. There was also a slight transitory defect of smell on the right side, some loss of sensibility in the area of distribution of the second and third divisions of the fifth nerve, and slight left facial paresis. Radiograms showed a small pellet lying slightly to the left of the middle line and just at the anterior border of the sella Turcica. He conceives that the shot, in entering the left side of the neck, injured a vein, thus producing the hæmatoma, that it found its way among the soft tissues to the foramen lacerum, passed through this to the interior of the skull, and came to rest against the lower outer side of the optic tract not more than 10 mm. or 15 mm. behind the chiasma. The disturbance of the left fifth and seventh nerves he attributes to local venous hæmorrhage, and the defect of smell on the right side to injury to the left uncus. Discussing the bearing of the case on the course of the visual fibres, he thinks it bears out Bernheimer's view that the crossed and uncrossed fibres unite immediately behind the chiasma, and do not remain apart from each other until the point at which they turn aside to reach the basal ganglia.

A. J. BALLANTYNE.

4.—Injuries from Animals.

(1) **Cohn, P.—Severe eye injury from a dog-bite. (Schwere Augenverletzung durch Hundebiss.)** *Wochenschrift f. Therapie u. Hygiene d. Auges*, Juni 15, 1911.

(2) **Cosmettatos, G. F.—Cyst of the conjunctiva caused by a dog-tick. (Kyste de la conjonctive produit par un tiquet de chien.)** *La Clinique Ophtalmologique*, 10 novembre, 1912.

(3) **Takashima, S.—The kurokusakame as a cause of eye disease. (Ueber die Kurokusakame als Erreger von Augenleiden [Conjunctivitis entomo-toxica].)** *Klin. Monatsbl. f. Augenheilkunde*, Dezember, 1912.

(4) **Takashima, S.—Conjunctivitis due to eel's blood (conjunctivitis ichthyotoxica). [Ueber Aalblutkonjunktivitis (Conj. ichthyotoxica).]** *Klin. Monatsbl. f. Augenheilkunde*, Juni, 1913.

(5) **Bär, Carl.—Cataract from the sting of a wasp. (Cataracta nach Wespenstich.)** *Klin. Montsbl. f. Augenheilkunde*, September, 1913.

(6) **Oblath.—The irritative action of blood or bile of the eel on the eye. (Dell'azione irritativa del sangue e della bile d'anguilla sull'occhio.)** *Arch. di Ottal.*, March, 1914.

(1) **Paul Cohn**, of Berlin, reports a very severe injury of the eye in a boy of ten, from the bite of a large Russian greyhound, which had not been teased. The inner two-thirds of the lower eyelid were torn through and hanging to the outer portion by a narrow bridge. There was a large gaping wound penetrating the cornea in its upper third, and reaching 2 mm. into the sclera on the nasal side. Iris and vitreous were prolapsed. The anterior chamber

was shallow and full of coagulated blood. Permission for immediate exenteration of the globe was refused by the parents; and the wound was accordingly cleansed as carefully as possible; xeroform dusted on; and the eyelid sutured. In spite of the seeming quietness of the eyeball, the boy was transferred on the following day to the Rudolf Virchow Hospital for protective inoculation. The explanation of this exceptionally rare injury is the shape of the dog's head and jaw, which is small and runs to a point, and had thus allowed him to bite right into the soft tissues of the orbit. Praun and Wagenmann (in Græfe-Sæmisch), under dog bites, mention injuries of the eyelids alone.

The author appeals for the immediate re-imposition of the order for the muzzling of dogs, at least of large dogs in Berlin, which had been revoked a few weeks before he wrote. W. B. INGLIS POLLOCK.

(2) **Cosmettatos,** of Athens, describes the microscopic appearances of a conjunctival cyst which was caused by the remains of a dog-tick, namely, the head and feet, the rest of the animal having been removed by the patient himself. Microscopic appearances showed that it was a serous cyst of the conjunctiva. After the short description of this case, the author gives a review of the literature of traumatic cysts. ERNEST THOMSON.

(3) **Takashima**, of Saga, Japan, tells us that in Japan, the country people attribute many cases of conjunctival blennorrhœa and blindness to the insect, *Scotinophora vermiculata*, which is known in Japan as the "kurokusakame," or, popularly, as "fu" or "fumuski." During the summer the insects are very abundant up to the time of the rice harvest. They fly into the houses and gather round the lamps, and the people are in the habit of catching them with their fingers. Takashima reports four cases of redness and swelling of the lids and conjunctiva attributed to the "fumuski." In three of these, the insect had flown into the eye of the patient, while the fourth patient had rubbed the eye with his fingers after handling one of the insects. In each case the symptoms subsided in the course of a few days.

The author carried out experiments on the eyes of rabbits, by instilling the juice expressed from the bodies of the insects, or alcoholic extracts of their bodies, also by bringing the bodies of the insects into actual contact with the conjunctiva. By all these methods similar symptoms were produced, and comparing these results with the appearances found in the patients referred to, he comes to the conclusion that the kurokusakame produces an affection of the eye the chief symptoms of which are œdema of the lids and conjunctiva, redness of the lids and conjunctival hyperæmia, lacrymation, and mucopurulent discharge. He did not find support for the popular belief that the insect could cause blindness through severe conjunctival blennorrhœa.

A. J. BALLANTYNE.

(4) **Takashima**, of Saga, Japan, discusses a form of conjunctivitis sometimes seen in fishers after contact with the blood of the eel. In a series of experiments on laboratory animals he found that simple instillation of the blood or blood-serum of the eel gave rise to moderate hyperæmia and chemosis of short duration. If the conjunctiva had been previously injured, or if the blood were injected subcutaneously, a much more severe reaction was produced. The histological changes are described and figured. The toxin concerned is believed to be contained in the protein constituent of the serum.

A. J. BALLANTYNE.

(5) **Bär,** of Meran, saw a child fourteen days after it had been stung on the eye by a wasp. The seat of the sting was visible as a small white speck in the centre of a red spot downwards and outwards from the cornea. In the lower-outer part of the pupil a triangular white opacity of the lens

could be seen, and there was a posterior synechia of the iris at the same point. Vision was normal, and there was no change in the fundus. The lens opacity became total and linear extraction was performed, good vision being afterwards obtained with glasses.

The author thinks that the mechanism of the causation of the cataract is uncertain. Probably the toxin of the wasp sting acted on the lens, either directly or through disturbance of the ciliary body, but the possibility of direct injury to the lens cannot be excluded. A. J. BALLANTYNE.

(6) **Oblath** has observed—what must be a very rare accident—a case of conjunctivitis following the direct action of blood and bile of an eel. He has found by experiment that eel's serum produces complete hæmolysis, and that even in great dilution, 1-640, this effect is perceptible. In the few cases of conjunctivitis noted in human subjects from this cause, the duration has been generally short. In Oblath's case, it was, however, considerable—some six weeks. H. GRIMSDALE.

5.—Scalds.

(1) **Rosenfeld, M.—Scald of the cornea and conjunctiva. (Verbrühung der Kornea und Konjunktiva.)** *Centralbl. f. prak. Augenheilkunde*, Oktober, 1911.

(1) **Rosenfeld,** of Budapest, records a case of scalds of the cornea and conjunctiva produced by hot fomentations.—The patient, the wife of a doctor, aged 28 years, had been under treatment for recurrent keratitis, and on the occurrence of a fresh attack while in the country, applied to the affected eye hot fomentations for over half an hour. These gave her relief and were in no way painful. On her husband's return in the evening, he at once sent her to the clinic on account of the following condition.—In addition to much injection, the whole cornea and conjunctiva for about 3 mm. around the limbus were milky-white. The epithelium was raised into many blisters and in some places there were loose tags of epithelium. The patient was suffering from hysteria. She had anæsthesia of both hands and forearms and also in the region from the upper lip upwards including both conjunctivæ and corneæ. The condition cleared up, leaving only slight opacities in the lower half of the cornea. A. LEVY.

6.—Industrial Injuries.

(1) **Lagrange.—Industrial accidents in the pathology of the eye. (Des accidents du travail dans la pathologie oculaire.)** *L'Ophtalmologie Provinciale*, novembre, 1912.

(1) In a clinical lecture on this subject, **Lagrange,** of Bordeaux, reviews the various ocular conditions likely to be produced by accidents received at work. Foreign bodies of the cornea in the case of flying particles of hot metal may produce burns of the cornea ; on the other hand, pieces of metal from hammers, and cutting tools, are likely to give rise to injuries that easily become septic, especially if the conjunctiva and lacrymal sac are diseased. After the removal of a foreign body, Lagrange recommends the use of aristol ointment and pad and bandage. Besides infections of the cornea and iritis, he mentions the possibility of minute retinal hæmorrhages.

He discusses the question whether an employer is liable for the result of an injury to an eye with previous disease, such as lacrymal obstruction, and recommends that workmen should be medically examined before they are taken on.

Contusions of the eyeball and rupture of the sclerotic are produced by blows on the unprotected part of the eye. The complications are mentioned, *e.g.*, dislocation of the lens, sympathetic disease, traumatic cataract, with partial or complete opacity. The infected and greenish-looking cataract is associated with kerato-iritis, the retina and vitreous soon become affected, and phthisis bulbi results. Wounds in the ciliary region and those complicated with retained foreign bodies, are most likely to be followed by sympathetic disease. He emphasizes the importance of carefully examining the patient before granting a certificate, and he gives a German table to assist the oculist in calculating the amount of compensation necessary after an injury to one or both eyes, based on the visual acuity of each eye. P. A. HARRY.

7.—Perforating Injuries.

(1) **Bouchart, A.—Penetrating orbital umbrella injuries. (Coups de parapluie pénétrants orbitaires.)** *Recueil d'Ophtalmologie*, février, 1911.

(2) **McLean, William.—Penetrating wounds of the eye leading to enucleation : presentation of specimens.** *American Medicine*, January, 1912.

(3) **Behr, Karl.—Choked disc associated with perforating wounds of the eyeball. (Ueber die im Anschluss an perforierende Bulbusverletzungen auftretende Stauungspapille.)** *Klin. Monatsbl. f. Augenheilkunde*, Januar, 1912.

(4) **Bourgeois.—Penetrating wounds of the sclerotic. (Plaies pénétrantes de la sclerotique.)** *L'Ophtalmologie Provinciale*, septembre, 1912.

(5) **Hack, R.—A case of eversion of the pigment layer of the iris.** *Archives of Ophthalmology*, March, 1913.

(6) **Davids, Herm.—Double perforation of the eyeball by puncture. (Doppelte Perforation des Auges durch Aufspiessen.)** *Klin. Monatsbl. f. Augenheilkunde*, Juli, 1913.

(7) **Contino.—A clinical and pathological study of wounds of the ciliary body. (Sulle ferite del corpo ciliare ; studio clinico ed anatomo patologico.)** *La Clinica Oculistica*, July-November, 1913.

(8) **Deutschmann, R.—Severe explosion injury with membrane formation in the vitreous and detachment of the retina, cured by operation. (Schwere Explosionsverletzung mit Membranbildung im Glaskörper und Netzhautablösung, operativ geheilt.)** Deutschmann's *Beiträge zur Augenheilkunde*, Heft lxxxvii, April, 1914.

(1) **Bouchart,** of Limoges, recites three cases of umbrella injury of the orbit :

Case i.—A man, aged 20, struck on the supero-external part of the left orbit by an umbrella. Probe demonstrates a wound $6\frac{1}{2}$ cm. deep, with much œdema round it, with impairment of ocular movements. The patient had had headache and signs of cerebral irritation, increased temperature, and some suspicion of tetanus. All gradually disappeared, but three to eight weeks after the accident, the optic disc was pale, although vision was practically normal. Eighteen months later, the sight was quite normal.

Case ii.—After injury of the upper-inner angle of the orbit with the ferule of an umbrella, a small wound was associated with complete loss of sight and ocular movements on the injured side. Two weeks later, some signs of pallor of the disc, and return of ocular movements. At the end of six months, V.=8/10; slight ptosis and pallor of disc persist.

Case iii.—Umbrella injury of supero-external angle of orbit. Two wounds, slight œdema, tenderness over pulley of superior oblique, V.=$\frac{1}{2}$. Vision recovered, but at the end of three months, there was some diplopia from paresis of the oblique.

Case iv.—Wound of supero-internal angle of right orbit from fall on piece of harness, which caused detachment of the pulley of the superior oblique. Eight months later, patient had recovered the function of the oblique.

The pallor of the disc and the paralysis of the recti are ascribed to the pressure of œdematous and cicatricial tissues on the vessels and nerves supplying these structures, as no question of fracture of the optic canal or direct injury of the muscle could be raised. J. JAMESON EVANS.

(2) The title of this article by **McLean,** of New York, is misleading, since of the nine specimens, one was a case of glaucoma and another of melano-sarcoma. S. E.

(3) Increase of intracranial pressure will not explain all cases of choked disc. The latter occurs with anæmia, hæmorrhage into the optic nerve sheaths, perforating wounds of the globe, and other conditions not accompanied by changes of intracranial pressure.

According to **Behr,** of Kiel, the factor common to all forms of choked disc is stasis of the tissue fluids formed in the papilla and optic nerve. Such stasis might be due either to obstruction to lymph flow or to excessive lymph production. Behr has published the results of researches which show that the lymph of the optic nerve and retina passes to the intracranial lymph spaces *via* the optic nerve itself. An intracranial tumour, by producing œdema of the brain or hydrocephalus, causes the intracranial portion of the optic nerve to be compressed between the brain and the unyielding bone. Lymph stasis occurs, and is manifested by œdema of the nerve head. The same factor of lymph stasis underlies the unilateral papillœdema which occurs with orbital tumour, hæmorrhage in the nerve sheaths, and other like conditions. The choked disc which is found in some metabolic diseases is explained as an active lymph stasis due to excessive production of lymph.

Coming to the proper subject of his paper, Behr quotes a number of cases in which, after a perforating wound of the globe, papillœdema was found. Microscopical investigation showed that it was a serous œdema of the nerve fibre layer, limited to the disc and its immediate neighbourhood, and not affecting the nerve behind the lamina cribrosa. A feature common to all the cases was great reduction of the ocular tension, of longer or shorter duration. For these cases Behr adopts a mechanical explanation. The normal intraocular pressure is a factor in keeping up the flow of the retinal and neural lymph towards the cranial cavity. Reduction of this pressure leads to retention of the tissue fluid in the loosely-built tissue of the papilla. At the same time there is dilatation of the retinal vessels, which also leads to increased secretion of lymph. A. J. BALLANTYNE.

(4) **Bourgeois**, of Reims, reports three cases, illustrating wounds of the sclerotic behind the ciliary region.

1.—A man, aged 46, was struck on the right eye by a piece of stone that he was breaking on May 9th, 1911. He was seen by the author on the 13th. Slight redness was noticed in the region of the semilunar fold of the right eye, the visual acuity was considerably reduced, and the tension was – 1 under cocaine and with the lids kept open by a speculum; a wound 1 cm. long at the level of the inferior border of the internal rectus. Some vitreous escaped from the wound. A needle threaded with fine silk was used to close the opening, which was practically covered by the plica semilunaris when the patient looked inwards.

2.—An agricultural labourer was struck by a garden rake, one tooth of which penetrated the skin near the internal canthus, and another the sclerotic at the outer and lower part. The wound edges were contused and irregular, there was no escape of vitreous, but the tension was reduced and vision was practically *nil*; the fundus details were invisible. There was a traumatic mydriasis, the pupil did not react to light; the lens was not dislocated. No attempt was made to close the wound, a dressing was applied, and pilocarpin instilled. Finally, the reduction of vision amounted to 10 per cent. The pupil remained dilated and inactive, and the lens became opaque.

3.—The third case was an injury with glass in a man of 33 years. The lower lid was cut vertically about 8 mm. from the external canthus, behind which was a penetrating sclerotic wound, with escaping vitreous. Tension—2. A stitch, traversing the entire thickness of the sclerotic, was inserted. The final result was good, and after several weeks, vision=6/12. P. A. Harry.

(5) **Hack**, of Würzburg, reports a case in which a black thread was seen to be floating in the anterior chamber, attached at one end to the pupillary margin. There had been a perforating injury some years previously, and an anterior synechia had formed. Hack explains the phenomenon by imagining that the blade of straw which produced the injury, had perforated the pupillary margin and injured the pigment layer, which, by reason of its inelasticity had ruptured at its ciliary margin and then become everted through the pupil. With a Sachs' lamp, the lower and outer quadrant of the iris allowed the red fundus reflex to show through, although it was less bright than through the pupil itself.

Hack quotes several other cases of isolated ruptures of the pigment layer of the iris following injuries of the eye. Rosa Ford.

(6) **Davids**, of Münster, was called to attend a boy who had, in falling, struck his eye against a picture hook attached to the wall. There was only slight redness of the eye and drooping of the upper lid. Tension was low. There was no pain. A small perforating wound was seen at the upper corneal margin with protruding iris. The aqueous was a little turbid, and there was some exudate in the pupil. Ophthalmoscopic examination detected a white patch, one and a half disc breadths in diameter, far up in the fundus. Its surface was partly covered with blood. Apparently, there was a tear of the retina and choroid at this point, and judging by the changes which the picture underwent, the author thinks that the sclera here was also perforated. Iritis, with hypopyon, set in, but ultimately there was recovery with full vision. A. J. Ballantyne.

(7) This long paper, which extends over two large numbers of this journal, is a very careful study of 34 cases of injury to the ciliary region. It does not lend itself to abstraction.

Amongst the large number of interesting points which are raised by **Contino**, Rome, is the question of sympathetic ophthalmia. In five cases he notes sympathetic irritation; four of these submitted to enucleation, but the fifth refused, without any bad sequelæ as far as can be judged. In one case only—in which a large foreign body remained in the eye—true sympathetic ophthalmia was seen. HAROLD GRIMSDALE.

(8) The patient reported by **Deutschmann**, of Hamburg, received injuries to both eyes by the explosion of a case of detonators (*Sprengkapseln*). The left eye was so severely injured that it had been removed before the author saw the patient. In the right eye there was a small copper chip embedded in the deeper layers of the cornea, signs of cyclitis were present, and detachment of the retina was suspected. When Deutschmann first saw the patient, the vision was "fingers at 30 or 40 c.m.," the eye was quiet, and in the deeper part of the vitreous there was a prominent greyish-yellow membrane, full of holes and clefts, passing in a vertical direction. It looked like a detachment of the retina. The rest of the retina could not be made out. Under treatment with iodides and fibrolysin injections there was some improvement in vision (to "fingers" at 3.5 metres, excentrically), and a folded detachment in the retina could be seen in the lower part of the fundus. The latter showed a tendency to increase, and a successful attempt was made to cut the membrane which was supposed to be the cause of this detachment. The wound in the membrane gaped and allowed a more complete view of the fundus. There was a hæmorrhage at the macula which soon cleared up, and the retinal detachment disappeared. Ultimately the vision improved to 5/20 and No. 8 Jaeger. The author conceives that the membrane in the vitreous originated in a hæmorrhage, and by its contraction was the cause of the detachment. A. J BALLANTYNE.

8.—Contusions.

(1) **Lamb, R. Scott.—Mixed irregular astigmatism following injury to the eye.** *Ophthalmic Record*, March, 1911.

(2) **Fromaget, Camille.—Two cases of traumatic myopia due to advancement of the position of the lens. (Deux cas de myopie traumatique par avancement du cristallin.)** *La Clinique Ophtalmologique*, 10 juillet, 1911.

(3) **McCool, Joseph L.—Rupture of Descemet's membrane due to a blow from a blunt object.** *Ophthalmology*, April, 1912.

(4) **Le Roux, H.—A case of traumatic luxation of the lens into the vitreous. (Sur un cas de luxation traumatique du cristallin dans le vitré.)** *L'Ophtalmologie Provinciale*, juillet, 1912.

(5) **Purtscher, A.—Contribution to the subject of "Angiopathia retinæ traumatica." (Zur Kenntnis der "Angiopathia retinæ traumatica.")** *Centralb. f. prak. Augenheilkunde*, Januar, 1913.

(6) **Wicherkiewicz, B.—Traumatic expulsion of the lens. (Traumatische Ausstossung der Lense aus dem Augapfel.)** *Centralbl. f. prak. Augenheilkunde*, April, 1913.

(7) Fisher, J. Herbert.—A case of traumatic posterior lenticonus. *Ophthalmic Review*, April, 1913.

(8) Genet.—Subconjunctival dislocation of the lens. The rôle of the recti muscles in the bursting of the eyeball. (Luxation sous-conjonctival du cristallin. Rôle des muscles droits dans l'éclatement de la coque oculaire.) *Ann. d'Oculistique*, avril, 1913.

(9) Fejér, Julius.—Œdema of the cornea after forceps delivery. (Oedem der Hornhaut nach Zangengeburt.) *Centralb. f. prak. Augenheilkunde*, Juni, 1913.

(10) Baudry, S.—A contribution to the medico-legal study of the traumatic paralyses of the ocular muscles. (Contribution à l'étude médico-légale des paralysies traumatiques des muscles de l'œil.) *L'Ophtalmologie Provinciale*, juillet, 1913.

(11) Knapp, Arnold.—Report of a case of traumatic equatorial rupture of the sclera. *Archives of Ophthalmology*, September, 1913.

(12) Purtscher, O.—Vossius' ring-shaped opacity of the anterior lens surface. (Zur Kenntnis der Vossius'schen ringförmigen Trübung der vorderen Linsenfläche.) *Centralbl. f. prak. Augenheilkunde*, August-September, 1913.

(13) Fuchs, Ernst.—Regarding some unusual varieties of rupture of the sclera. *Ophthalmology*, October, 1913.

(14) Wray, Chas.—Double rupture of choroid between the macula and the disc with vision 6/18. *Transactions Ophthalmological Society U.K.*, Vol. XXXIII, 1913.

(15) Prélat.—Diagnosis of traumatic opacities of the lens without wound of the external membranes. (Diagnostic des opacités traumatiques du cristallin sans plaie des membranes externes.) *Archives d'Ophtalmologie*, novembre, 1913.

(16) Dunn, Percy.—Concussion cataract: its medico-legal aspect; with notes of an unusual case. *Lancet*, December 27th, 1913.

(17) Marbaix.—Some cases of ocular lesion caused by blows with balls. (Relation de quelques cas de lésions oculaires par coup de balle.) *La Clinique Ophtalmologique*, 10 mai, 1914.

(18) Collins, E. Treacher.—Concussion injury with rupture extending across the optic disc. *Trans. Ophth. Society U.K.*, Vol. XXXIV, 1914, p. 190.

(19) Coats, George.—Traumatic rupture of the pigment epithelium and dilatator of the iris. *Trans. Ophth. Society U.K.*, Vol. XXXIV, 1914, p. 184.

(1) **Lamb,** of Washington, D.C., reports the case of a clerk who was injured in both eyes by a broken coil spring. The sight of the right eye was lost, and the left cornea recovered with leucomatous scars, and vision of 6/3 with + 2 cyl. ax. 10° ○ — 2·75 cyl. ax. 115°. There is no definite statement as to his refraction before the accident. J. Jameson Evans.

(2) The two interesting cases of traumatic myopia reported by **Fromaget,**

of Bordeaux, with their wealth of clinical detail and the more or less speculative theories of the author regarding the exact mechanism at work, deserve to be read in the original in order to be appreciated.

ERNEST THOMSON.

(3) The patient, whose case is recorded by **McCool**, of Portland, a mechanic aged 21, was struck on the left eye by a piece of metal from a revolving piece of machinery. He was knocked down and stunned by the blow. Next day the lids were swollen and discoloured, the eyeball was intensely injected, the cornea hazy, the anterior chamber occupied by blood (both fluid and clotted), and the pupil moderately dilated. There was light perception, with good projection, and ophthalmoscopic examination was impossible. Examination with the binocular *loupe* and oblique illumination detected several fine greyish-white lines occupying the central area of the cornea and radiating from it. In less than three weeks, the eye was quite quiet, the corrected vision was 5/6, and examination disclosed nothing abnormal. There is, unfortunately, no statement as to the persistence or alteration of the corneal condition.

The author discusses at some length the other conditions in which ruptures of Descemet's membrane has been found, birth injuries, buphthalmos, etc. His attempts to explain the lesion are not very helpful. He assumes that when the eye was struck it was accommodating for an object at a distance of 20 inches, and that there might, therefore, be some tension on Descemet's membrane at the moment. Probably the centre of the cornea received the blow. He seems to think that the mechanical factors would be the same as those needed to produce iridodialysis, but that the force was insufficient to cause this and led to the rupture of Descemet's membrane and posterior layers of the cornea instead.

A. J. BALLANTYNE.

(4) This case reported by **Le Roux**, of Caen, was that of a woman of 77 years, who was struck in the right eye by a piece of wood. At an earlier examination, Le Roux had established the fact that there was incipient cataract (double) and a slight degree of myopia.

He saw her on the day of the injury. There was an extensive corneal abrasion, marked injection of the eyeball, and hyphæma. The ophthalmoscope showed mydriasis and iridodonesis; the anterior chamber was much deeper in this eye than the other, the fundus details were obscured, and vision was reduced to perception of light. These symptoms pointed to luxation of the lens. Cocaine and pilocarpine drops and iodoform ointment were prescribed.

A week later, the injection of the globe was considerably less and the hyphaema had disappeared, the vitreous was transparent, and the lens could be observed lying in the lower part of the posterior chamber, changing its position slightly at each movement of the eyeball. Le Roux supplied her with a + 10 D. lens, with which she got fair vision. Three-and-a-half years later, the vision in the eye with the dislocated lens was 6/24, while the lens of the other eye was completely cataractous. The tension of the injured eye was normal, possibly due to the fact that since the accident the patient has instilled pilocarpine twice daily.

P. A. HARRY.

(5) **Purtscher**, of Klagenfurt, has already described in von Graefe's *Archiv*, Bd. LXXXII, Heft ii., the condition which he calls "Angiopathia retinæ traumatica." There are in the literature altogether about ten cases described. The ophthalmoscopic picture is that of multiple brilliant white areas distributed all over the retina accompanied by some hæmorrhage. These spots appear to be situated in the deepest layers of the retina They occur three or four days after a severe cranial injury or possibly also after severe compression of the body with an associated rise in intracranial pressure, and they completely disappear in from one to three months. They are due,

according to Purtscher, to an extravasation of lymph in the retina. This lymph contains the products of broken-down cerebral tissue and thus has a toxic action upon the retinal elements. A. LEVY.

(6) **Wicherkiewicz,** of Cracow, reports the case of a man, aged 52 years, who received a blow on the left eye from the horn of a calf. There was much pain and inflammation, which gradually subsided. Vision, however, remained poor, and so nine months after the accident, he sought the advice of a specialist. The condition found was a normal R. eye V. c. + 1·5 = 6/6. L. c. + 13 = 6/6 + 17 = Sn. i. The left eye has above a long pigmented sclerectasia, situated ½ mm. behind the corneal limbus, and occupying 2/7 of the circumference, and below this a 6 mm. wide coloboma of the iris. The eye is otherwise normal except for a small opacity in the upper part of the vitreous.

Teale reported a similar case in the *British Medical Journal*, 1907, page 375. A. LEVY.

(7). The patient, aged 40 years, whose case is recorded by **Fisher**, of London, had received a blow with a cricket ball on the right malar bone, and afterwards found that the sight of the right eye was defective, causing difficulty at near work. The vision was 5/5 and Jaeger 10 at 30 inches, the left being 5/5 and Jaeger 1 at ordinary range; the pupil reactions were good and there were no signs of central nervous disease. Three weeks later, the sight was more blurred; after a further interval of fifteen months, vision was 5/36, improved to 5/9 partly with —0·5 sph. and —0·5 cyl. ax. vert. Examination, after a mydriatic, showed a definite protrusion of the posterior pole of the lens; the peripheral part of the lens was hypermetropic, the vision through it being 5/9 unaided. Nine months later, the eye was more myopic, the sight was less than 5/60 and Jaeger 1 at 2 inches. In five and a half years, the lens became totally opaque, the pupil and tension remained normal and the field to light good. Fisher suggests that a minute rupture in the posterior lens capsule took place as the result of the blow, first giving rise to alteration of the lens curvature, and then a slowly developing hernia of the lens substance followed by increasing opacity. If this explanation be the true one, the case is the first of its kind to be recorded. A. H. PAYAN DAWNAY.

(8) **Genet**, of Lyons, records a case of subconjunctival dislocation of the lens caused by a kick with a man's foot, which also fractured the nose and the orbital border, and caused a wound of the lip. He criticises the explanations usually given of the mechanism by which the lesion is caused, and suggests that contraction of one of the recti probably plays a large part in tearing the sclerotic. R. J. COULTER.

(9) **Fejér**, of Budapest, saw a child, four weeks old, with opacities of the left cornea and some small subconjunctival ecchymoses. The opacities had been much more marked, and were noticed immediately after the birth of the child, which had taken place with the aid of forceps. There were no signs of injury anywhere else. A. LEVY.

(10) In an article of some length **Baudry,** of Lille, emphasizes several points. The lesions may vary according to the seat of injury, *e.g.*, the base of the skull, the basal nuclei, the origins of the nerves, the sphenoidal fissure, or the orbital cavity. In some cases the lesion is in the muscle itself. Lesions of the motor nerves of the eye are also produced by fractures of the vault or by projectiles penetrating the skull through the ear, orbit, or mouth.

The prognosis and medico-legal consequences depend on the pathological anatomy which determines and accompanies the paralysis, the degree of curability, the occupation of the patient, and the previous condition of the eye. As a rule, the prognosis of traumatic paralyses is favourable. In cases where the paralysis persists, the diplopia and false projection cease to give trouble; there is a cerebral neutralisation of the false image and a muscular re-education as to the position of objects takes place. The vertigo is aggravated when the patient ascends or descends from the ordinary level. This is a serious obstacle to resuming certain occupations.

The author also adds a section on traumatic pseudo-paralyses and simulation. P. A. HARRY.

(11) The case reported by **Knapp,** of New York, was that of a woman of 68 years, who received a blow on the eye from the edge of a table which wounded both lids near the caruncle. The eye retained normal tension for ten days and at first there was no sign of the scleral rupture which had occurred, although on the tenth day, when the eye was less red, a bluish swelling was seen under the conjunctiva up and out. The eye was removed and showed an open wound in the sclera 10 mm. long, 2 mm. behind the insertion of the rectus exterior, and 10 mm. behind the corneo-scleral margin, running concentrically with the equator. The edges were everted. The gap was filled with blood-stained tissue containing a knuckle of retina. A circumscribed hæmatoma in Tenon's capsule over the site of the rupture was the cause of the bluish swelling which had heen seen clinically. The retina was completely detached and the subretinal space filled with coagulated blood and blood-stained watery fluid. No vitreous was present. There was moderate choroidal detachment from blood, the lens was dislocated backwards, the iris partially retroverted, and in the anterior chamber was a greyish exudate.

(12) **Purtscher**, of Klagenfurt, remarks that these ring-shaped opacities of the anterior lens surface, first described by Vossius, have not been reported very frequently. Yet he thinks they often occur, but are not looked for. He reports six cases. They occur in young people after an accident which has caused a sudden compression of the eyeball, the explanation being that the sudden blow either drives the cornea backward, or the lens forward, according to the direction of action of the impinging force, and the edge of the iris becomes imprinted upon the anterior surface of the young and therefore soft lens. They always disappear without leaving any trace behind them.

A. LEVY.

(13) **Fuchs**, of Vienna, alludes to an atypical form of indirect rupture of the sclera, consisting of a small wound, 2 mm. to 4 mm. in length, situated much closer to the limbus than the typical rupture or even in the limbus or the clear cornea. The overlying conjunctiva is invariably ruptured, and there is a prolapse of the iris. Sometimes there are small tears of the iris or iridodialysis. Complete detachment of the iris has not been seen in this form. There may be tearing of the zonule, evidenced by the fact that vitreous presents in the wound in a third of the cases, or rupture of the lens capsule, evidenced by local clouding of the lens shortly after the injury. This type of scleral rupture is relatively common in young persons. The prognosis is good. None of the eyes he has seen have been lost, and most of them regained good vision. The mechanism is exactly the same as that of the larger and more common type of rupture. The treatment consists in prompt excision of the prolapsed iris. A. J. BALLANTYNE.

(15) **Prélat** discusses the difficulties which present themselves in attempting to come to a conclusion as to whether a lental opacity is the result of trauma or other cause.

Excluding those cases where the opacity is transitory or where there is a rupture of the capsule, there is no certain sign which allows a positive diagnosis of traumatic cataract. Evidence of injury in the lids or in the neighbourhood of the globe is not necessarily conclusive, for the opacity may have pre-existed.

By elimination, however, of all other causes of cataract and by taking into account the history, age of the patient, the nature of the opacity (star-shaped or otherwise), and its situation, with the onesidedness of the lesion, a fairly certain diagnosis may be arrived at.

The importance of the subject from a medico-legal aspect is obvious.

BERNARD CRIDLAND.

(16) **Dunn**, of London, after some remarks as to the difficulty of determining the exact ætiology of those cases in which there is no visible rupture of the capsule, since no *post-mortem* examination of such a case is known, proceeds to his own case.—Here a workman was struck on the cornea with a small chip of steel, described as measuring 1/16 inch. Two small foreign bodies were removed from the cornea by the house surgeon of a general hospital. Blurring of vision began about seven days after the accident, and increased up to counting fingers on the day the patient came to consult Dunn. A skiagram was taken with negative result. About nine months later, the cataract was extracted and good vision was obtained with correcting lenses. The case went to court. It was proved that the machine at which the man had been working was defective, and after Dunn had given evidence that although sight had been restored by operation, binocular vision had been abolished, the jury awarded £273 and costs.

Dunn comments on the small size of the non-penetrating body which caused cataract by concussion, and the amount of the damages. As he points out, the amount almost equals that which insurance companies offer for permanent and total loss of vision in an eye. "Presumably," says the author, "in awarding the damages the jury were influenced more by the fact that the injury had necessitated an operation than by the result of the latter."

ERNEST THOMSON.

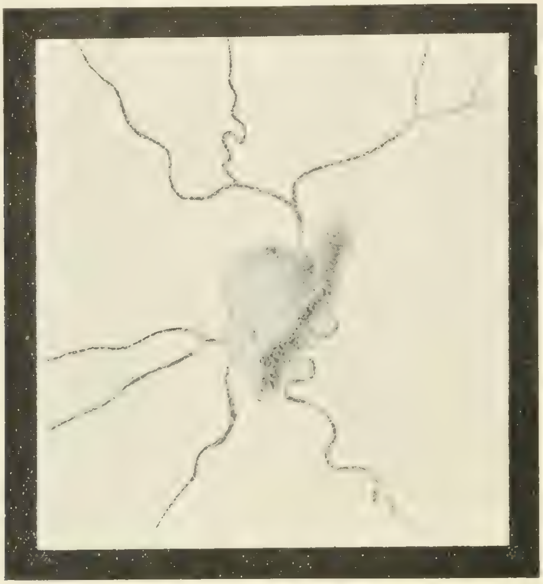
(17) **Marbaix**, of Tournai, has an interesting article on his experiences with injuries of the eye caused by various kinds of playing ball.

The ball which gives rise to the most severe injuries is, as one might expect, the small hard ball which gets past the orbital ridge, while the least dangerous is the large football. All sorts of injuries are related, from corneal abrasions to rupture of the choroid. Strange to say, the author has not seen dislocation of the lens in connection with such injuries. One of the most interesting types of injuries is that of folding of the retina. This, we gather, simulates the appearance of rupture of the choroid. In one case which the author watched for two years the condition repeatedly relapsed, while the vision deteriorated at the same time in correspondence with fresh attacks of hæmorrhage. Eventually, the retinal injury became cicatrised and pigmented, while the vision came nearly to normal. In the course of the two years, the patient underwent very severe treatment of various kinds, including prolonged periods in a dark room, vegetarian diet, daily purgation, leeches to the temple, cold compresses, strychnine internally and so on. Such treatment was carried out under the orders of Coppez (*père*).

ERNEST THOMSON.

(18) **Collins**, of London, exhibited one of those rare cases where a contusion of the eye had caused a rupture of the optic disc.

The patient, 12 years of age, had received a blow from a bat upon her left eye. Immediate results were conjunctival œdema and hæmorrhage, semi-dilated and inactive pupil, retinal hæmorrhage, and reduction of sight to fingers at one foot. Some few days after the injury, it was observed that the lens was subluxated, and that the vitreous humour was cloudy. Sixty-one days after the accident, the vitreous having by that time cleared sufficiently to allow of an examination of the fundus, a peculiar state of things was found.—A deep, broad, pigmented, granular line was present at the outer side of the optic disc extending partly across its margin to some little distance both above and below. The lower nasal retinal vessels, as shown in the figure, disappeared at the edge of the disc round a lipped edge. The lower temporal retinal vein, which did not reach the optic disc, ended in a convoluted way in the aforesaid pigmented band. V.=hand movements. Later in the course of the case, a small opacity formed at the lower margin of the lens.



SYDNEY STEPHENSON.

(19) Instances of traumatic rupture of the pigmented epithelium of the iris have been recorded by Gelpke (1887), Pohlenz (1891), and Boerma (1893).

Coats, of London, had a case of this kind in a man, aged 61 years, whose right eye had been struck with a large piece of wood a month before he sought advice. V. (corrected)=6/12. A scar, about 3 mm. in length, was present in the centre of the cornea. The pupil of the affected eye was slightly larger than that of the other eye, and was of oval shape, the major axis of the

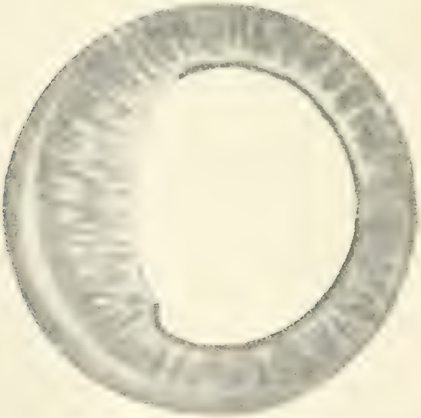


FIG. 1.

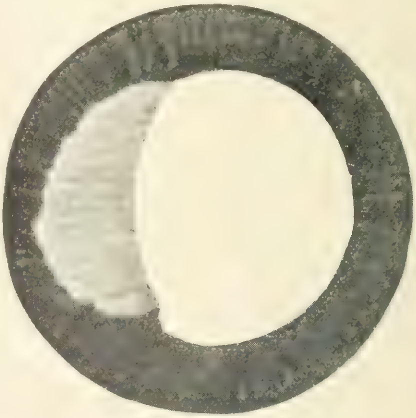


FIG. 2.

oval being directed obliquely downwards and outwards. On close examination, the stroma of the iris seemed to be looser on one side than the other. After the use of homatropine, the appearance of the parts, as shown by the figures, was very striking. The outer part of the iris remained flaccid, while the other parts retracted as usual. The pigmented rim was present except on the outer side. Light thrown into the eye from an ophthalmoscope gleamed through the interstices of the stroma in the affected part (fig. 1). With the transilluminator, the remarkable condition shown in fig. 2 was revealed. The outer segment of the iris opposed practically no barrier to the passage of the rays of light, so that the part in question was almost perfectly translucent.

The lesion is probably produced by driving back of the iris, the rupture being the outcome either of excessive stretching or of nipping of the iris between cornea, on the one hand, and lens, on the other.

Finally, Coats points out that the clinical appearances in the foregoing case confirm the view of Langenhan and Fuchs, which is to the effect that the imperviousness of the iris to light depends chiefly upon the pigmented epithelium. SYDNEY STEPHENSON.

IX.—REMEDIES.

(*Eleventh Notice.*)

(1) **Paton, Leslie.—Two cases of rodent ulcer treated with carbon dioxide snow.** *Proc. Roy. Soc. of Med.*, January, 1914.

(2) **Parsons, J. Herbert.—Specimens of experimental glasses prepared by Sir William Crookes, O.M., P.R.S.** *Proc. Roy. Soc. of Med.*, January, 1914.

(3) **Kümmell, R.—On the treatment of ulcus serpens corneæ. (Zur Behandlung des Ulcus serpens Corneæ.)** *Münch. med. Woch.*, Juni 16, 1914. Abs. *Medical Record*, October, 1914.

(4) **Dutoit.—The occurrence of a case of neuroparalytic keratitis following the injection of alcohol into the superior maxillary nerve in a case of facial neuralgia. (Beobachtung eines Falles mit Keratitis neuroparalytica infolge einer Alcoholinjection in den Nervus maxillaris superior bie Gesichtsneuralgie.)** *Zeitschrift für Augenheilkunde*, Juli, 1914.

(1) **Paton**, of London, has treated two cases of rodent ulcer with carbon dioxide snow, with the result that in both all signs of ulceration definitely disappeared. R. H. ELLIOT.

(2) **Parsons**, of London, showed before the Royal Society of Medicine, specimens of various glasses prepared during the last few years by Sir William Crookes for the purpose of cutting off heat and ultra-violet radiation. The metals used to tint the glasses were cerium, chromium, cobalt, copper, iron, lead, manganese, neodymium, nickel, praseodymium, and uranium. Iron salts cut off heat rays ; so also do copper and lead, but their action is weaker. Cerium salts proved powerful in cutting off ultra-violet and infra-red rays ; chromium cuts off chiefly ultra-violet rays ;

neodymium and praseodymium are very potent in cutting off ultra-violet rays.
R. H. ELLIOT.

(3) In recent cases, iodoform ointment, hot fomentations, and atropine may cure a corneal ulcer. But in many cases the ulcer spreads in spite of treatment and is arrested only after repeated application of the thermo-cautery or paracentesis. The resulting scar is usually serious, and accounts for a large proportion of cases of partial or complete blindness, especially amongst the rural population.

The majority of these ulcers are due to the pneumococcus. Morgenroth and his assistants have shown that optochin (ethylhydrocuprein), which is a derivative of quinine, has a marked action on pneumococci. But as the organisms acquire a certain tolerance, it is well to apply the drug in as concentrated a form as possible in order to destroy them at once. The degree of concentration is limited by its action on the tissues. Solutions of less than 1 per cent. have no action on the pneumococcus and those of 1·5 per cent. produce superficial necrosis of the conjunctiva. If application is limited to the ulcer itself, a 2 per cent. solution may be used. The salt employed is usually the hydrochloride of ethylhydrocuprein, which is readily soluble in water.

Kümmell, of Erlangen, has treated seventeen cases of ulcus serpens with this application, and, with one exception, with uniform success. An early ulcer occurs as a greyish-yellow patch, perhaps only ½ mm. in diameter. Its serious character is betrayed by a more or less marked steaminess of the surrounding cornea, which is often arranged in lines radiating from the ulcer, by a slight change in the colour of the iris, and myosis. In this early stage hypopyon may be absent, but if the edge on one or more sides of the ulcer extends, it invariably develops. If optochin is applied, on the following day the cornea surrounding the ulcer is clearer, though the ulcer itself appears more opaque. The latter is due to the presence of discharge which can be removed. In favourable cases the ulcer becomes clean within a few days. In less favourable the edge of the ulcer becomes clean, but the centre remains turbid for some days longer. In cases in which the ulcer is spreading, optochin invariably arrests it. In a case in which, when first seen, the ulcer had spared only a narrow strip of cornea on the nasal side the appearance was so ominous that further advance seemed inevitable. But under optochin this did not occur. The steaminess of the cornea round an ulcer also rapidly subsided, and hypopyon usually cleared up spontaneously. The accompanying iritis was also favourably influenced, and atropine, which before the application of optochin had no effect, dilated the pupil and broke down adhesions. Perforation of the cornea, one of the most dreaded complications, occurred in one case after the application of optochin. But the case had been neglected, and the ulcer involved half the cornea. The perforation occurred the day after admission to hospital, and was probably inevitable. In another case hypopyon was so extensive that it was removed by paracentesis. The resulting cicatrices and opacities never exceeded the original ulcer in size, and were often smaller.

As optochin has a specific action only on the pneumococcus, it is well, whenever possible, to make sure that this organism is present. After the application of cocaine, some of the secretion should be obtained from the advancing edge of ulcer. Great care is required not to injure the cornea, as great harm may result from unskilful manipulations. If the pneumococcus (Gram-positive) is present, optochin is the best application, but if, as occurs in a minority of cases, Gram-negative diplobacilli are found, zinc sulphate is preferable. The optochin may be applied directly to the ulcer in a

2 per cent. solution on a cotton-wool swab, or in a 1 per cent. solution as drops. The writer employs a combination of both methods. The application at first produces violent smarting, so that the cornea should be anæsthetized, but afterwards itself has an anæsthetic action, which is continuous if renewed hourly. The treatment must be continued until the ulcer is healed; otherwise an exacerbation occurs. Atropine must also be employed until the pupil is widely dilated. In the writer's cases no fomentations were applied and the eye was not bandaged. Good results were also obtained in dacryocystitis with irrigations with optochin lotion.

Corneal ulcers not due to the pneumococcus are comparatively rare. During the time seventeen pneumococcal ulcers came under observation, three were seen which depended on the diplobacillus of Morax-Axenfeld.

(4) **Dutoit**, of Montreux, points out that alcohol injection into the affected nerve trunk is now recognised as a useful method of treating tic doloreux. Extirpation of the Gasserian ganglion is a very severe operation, and not infrequently leads to complete loss of the eye. In consequence, most surgeons prefer to resect the cerebral root of the ganglion, a procedure which is regarded as far less likely to be followed by neuroparalytic keratitis. The injection of alcohol is even less liable to be followed by keratitis, but cases have been recorded by Patrik, Campbell, and van Lint. Siccard says that paralysis of the sixth nerve may follow the injection into the superior maxillary nerve in the foramen rotundum. The author adds another case which occurred in his own practice. Fortunately, energetic treatment with dionine was successful, and the eye was saved.

T. HARRISON BUTLER.

BOOK NOTICES.

The Ophthalmic Year Book, 1913, Volume X. Edited by EDWARD JACKSON. Assisted by numerous collaborators. Illustrated. Pp. 460. Price . Denver, Colorado: Herrick Book and Stationery Company, 1914. Price (post paid), 5 dollars.

Once again we welcome Jackson's Year Book. It is perhaps permissible to say that of the various publications which deal annually with ophthalmic literature, this one, in our belief, is *facile princeps*. For a time, as is well known, there was considerable doubt whether sufficient support of an active pecuniary nature was to be forthcoming from those who benefit most by such a publication to ensure its continuance. The labour and study involved are tremendous, and the expense is great. We are glad to find that the energetic editor and his collaborators have decided to proceed, albeit it has been deemed necessary to raise the price, after the present number, to ten dollars.

A glance through the volume indicates to what an extent contemporary literature has been overtaken, and, when one considers the annual amount which is published on our specialty, one cannot be surprised that, in certain cases at any rate, compression has been carried to a fine art. Thus, a certain procedure for the relief of glaucoma, of which it is extremely probable that the editor and his collaborators disapprove, is dealt with in three lines. That it has been found possible to compress the enormous literature of glaucoma into twenty-six pages, dealing with over 150 authors, is proof not only of able *précis* writing, but also of the wise selection which characterises the work.

A word may be said about the plan of the book. The contents bill gives the classification of subjects and the paging. If one wish to find in a single glance what has been written on a subject, one can turn up the page indicated. Here each author's name stands out in heavy type. Having found that a certain author's article is of interest, it is then only necessary to turn up the bibliography at the end of the volume in order to find the complete references. It is worthy of note that all the titles are in English. No doubt there are good reasons for this, although there are disadvantages from some standpoints. Again, an author's name being given, one finds from the bibliography the page on which his work is dealt with. Finally, there is a general index of subjects.

One might say a great deal in praise of this Annual, but "To paint the lily . . . . is wasteful and ridiculous excess." Everyone who wishes to know the last word on any ophthalmic subject should have the book, and to those who write on ophthalmology it is the handiest index to be obtained anywhere.

ERNEST THOMSON.

Transactions of the Twelfth International Congress of Ophthalmology, Petrograd, 1914. (Actes du XII Congrès International d'Ophtalmologie, Petrograd, 1914.)

We have received the first volume of the *Transactions* of the Ophthalmological Congress which would have taken place at Petrograd in August had not the outbreak of war rendered it impossible. This volume comprises the official "reports," "On the Nutrition of the Eye," by Professor Arnaldo Angelucci, of Naples, and on "The Ætiology of Trachoma," by Professor Th. Axenfeld, of Freiburg-im-Breisgau, along with some fifty-eight independent communications. Axenfeld's report forms a separate part extending to two hundred pages and illustrated with six coloured lithograph plates. The papers naturally cover a very wide field, and among them we notice contributions from Grossmann, of Liverpool, McCallan, of Egypt, and Elliot, of London. Abstracts of the more important items will appear in our pages in due course. Meanwhile, we cannot refrain from expressing sympathy with the organisers of the Congress, whose labours were so rudely interrupted by the clash of arms, and the hope that before long the clearing of the European atmosphere will permit the resumption and completion of their work—in Petrograd!

NOTES AND ECHOES.

Deaths.

WITH deep regret we have to record the death under tragic circumstances of Angus MacNab, the widely known and accomplished London ophthalmic surgeon. Captain MacNab was serving with the London Scottish regiment of Territorials. He took part in the now famous charge of that gallant body of men at Messines, and was left with two wounded soldiers under his care in a somewhat isolated position. When found by his comrades, MacNab and his charges had been bayoneted by the Germans.

The deceased, who was of Scottish descent, was born in New Zealand, where his brother, the Hon. Robert MacNab, was once Minister for Agriculture. He studied at the Universities of Otago, Edinburgh, Freiburg, and Vienna. He graduated B.A. (N.Z.) in 1895, and in the following year took the degree of B.Sc. In 1901 he proceeded to the degrees of M.B. and Ch.B. in the University of Edinburgh, and three years later took the F.R.C.S., England. After acting as house surgeon to the ophthalmic department of the Edinburgh Royal Infirmary, MacNab continued his special studies at Freiburg i. Br. and Vienna. His interest in ophthalmic bacteriology was attested by several original communications upon that subject, as well as by his masterly translation of Axenfeld's "Bacteriology of the Eye." He also wrote a very useful book dealing with "Ulceration of the Cornea" (1907), which included much of the work he had done at Freiburg. At the time of his death MacNab was ophthalmic surgeon to King Edward VII Hospital at Windsor, and was also connected in the capacity of chief clinical assistant with the Royal London Ophthalmic Hospital. Only last year he translated W. Lohmann's "Disturbances of the Visual Functions," a most favourable review of which was published in THE OPHTHALMOSCOPE of January last (p. 60) from the pen of Mr. George Coats.

George Strawbridge, the distinguished ophthalmic surgeon of Philadelphia, has joined the great majority at the age of 70 years. After graduating at the University of Pennsylvania in 1866, he studied eye and ear work at Berlin and Vienna. In the year 1875 he founded the Pennsylvania Eye and Ear Dispensary in Philadelphia.

Sympathy will be extended to our colleague, Dr. Antill Pockley, of Sydney, whose son, Captain Brian Colden Antill Pockley, surgeon to the Australian Naval Reserve, was recently shot while on duty with a landing party at Herbertshohe, German New Guinea.

* * * *

Appointments.

A. J. BALLANTYNE has been appointed lecturer on ophthalmology at St. Mungo's College, Glasgow, in place of A. Maitland Ramsay, resigned.

John P. Henry (MacEnri) has been appointed professor of ophthalmology and otology in University College, Galway.

V. D. Nimbkar has been appointed ophthalmic house surgeon to the Leeds General Infirmary.

* * * *

North of England Ophthalmological Society.

THE above society was formed on October 15th, at Manchester. Mr. Hill Griffith was elected President, Mr. A. Bronner, Vice-President, Mr. J. Gray Clegg, Treasurer, and Mr. Percival Hay, Secretary. The Society starts with 54 members. The next meeting will be held on December 10th, at Liverpool.

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Royal Westminster Ophthalmic Hospital.

FOR the use of the wounded suffering from injuries to the eye, the Royal Westminster Ophthalmic Hospital has offered to the War Office ten beds. The offer has been accepted.

THE OPHTHALMOSCOPE DIARY.

1914.

Midland Ophthalmological Society	December 1st	Birmingham.
Royal Society of Medicine : Section of Ophthalmology	December 2nd	1, Wimpole Street, London, W.
North of England Ophthalmological Society	December 10th	Liverpool.

1915.

Royal Society of Medicine : Section of Ophthalmology	February 3rd	1, Wimpole Street, London, W.
Royal Society of Medicine : Section of Ophthalmology	June 9th	1, Wimpole Street, London, W.
American Ophthalmological Society	July 6th & 7th	New London, Conn.
British Medical Association : Section of Ophthalmology	July 7th to 9th	Cambridge.
Oxford Ophthalmological Congress	July 15th & 16th	Keble College, Oxford.

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